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SMALL ICBM AREA NARROWING REPORT

VOLUME III
HARD SILO IN PATTERNED ARRAY BASING MODE

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SMALL ICBM
AREA NARROWING REPORT

VOLUME III:
HARD SILO IN PATTERNED ARRAY
BASING MODE

JANUARY 1986

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PREFACE

In accordance with Congressional and Presidential direction, the United States Air Force proposes to enter full scale development and select deployment areas in late 1986 for the Small ICBM weapon system. The deployment area selection will be supported by a Legislative Environmental Impact Statement (LEIS).

This Area Narrowing Report identifies the alternative deployment areas to be analyzed in the LEIS. It also documents the Comprehensive Siting Analysis Process through which potential locations were eliminated from consideration.

This Area Narrowing Report comprises an Executive Summary and three volumes. Volumes I, II, and III discuss Hard Mobile Launcher in Random Movement, Hard Mobile Launcher at Minuteman Facilities, and Hard Silo in Patterned Array, respectively.

Each of these volumes is structured the same. Section 1 provides the background and policies of the Small ICBM program. Section 2 contains system and operations descriptions. Section 3 provides an overview of the Comprehensive Siting Analyses Process. Sections 4 and 5 describe the application and results of the Exclusionary and Evaluative Criteria, respectively. Section 6 identifies the geographic areas not eliminated by the siting process.

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Appendices are included with each volume to provide more detailed information, such as the identification of United States military installations considered not suitable for the Small ICBM mission, descriptions of the Exclusionary and Evaluative Criteria, and how each potential main operating base and deployment installation fulfills the criteria.

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- Appendix D Hard Silo in Patterned Array Main Operating Base and Deployment Area Evaluation**

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1.0 INTRODUCTION

1.1 PURPOSE OF DOCUMENT

The purpose of this report is to identify those areas that could potentially support deployment of the Small Intercontinental Ballistic Missile (ICBM) utilizing basing modes presently considered viable: the Hard Mobile Launcher in Random Movement, the Hard Mobile Launcher at Minuteman Facilities, or the Hard Silo in Patterned Array.

Specifically, this report describes the process and the rationale supporting the application of Exclusionary and Evaluative Criteria and lists those locations that were eliminated through the application of these criteria. The remaining locations will be the focus of further investigations.

The report is divided into an executive summary and three volumes, one for each basing mode. Each volume presents an overview of system description; technical, operational, legal, and policy siting criteria; and potential locations remaining as a result of this analytical process. Volume I discusses Hard Mobile Launcher in Random Movement, Volume II discusses Hard Mobile Launcher at Minuteman Facilities, and Volume III discusses Hard Silo in Patterned Array. Each of the three volumes also includes appendices, which contain the goals, objectives, and rationale for each criterion, and

an evaluation of the candidate locations for that basing mode.

This particular volume describes the application of the Exclusionary and Evaluative Criteria to the Hard Silo in Patterned Array concept. The appendices for this volume present the definition and rationale for each of the Exclusionary and Evaluative Criteria, and an evaluation of each of the candidate locations for the Hard Silo in Patterned Array basing mode.

1.2 BACKGROUND

1.2.1 Policy/Direction

The President established the bipartisan Commission on Strategic Forces (Scowcroft Commission) in January 1983 to study the nation's strategic needs. The Commission concluded that the land-based portion of the TRIAD should be upgraded. Specifically, the Commission recommended the development of a Small ICBM. The President accepted this and other recommendations in the Commission's report.

The Glenn Amendment to the 1984 Department of Defense (DoD) Authorization Act directed an Initial Operational Capability (IOC) for the Small ICBM of 1992 or earlier. The amendment also directed that "...the design, development, and testing of a small, mobile, single warhead intercontinental ballistic missile be pursued as a matter of the highest national priority."

Acting on the Presidential decision and Congressional direction, the Air Force initiated engineering, siting, and environmental planning in support of a small, single warhead missile.

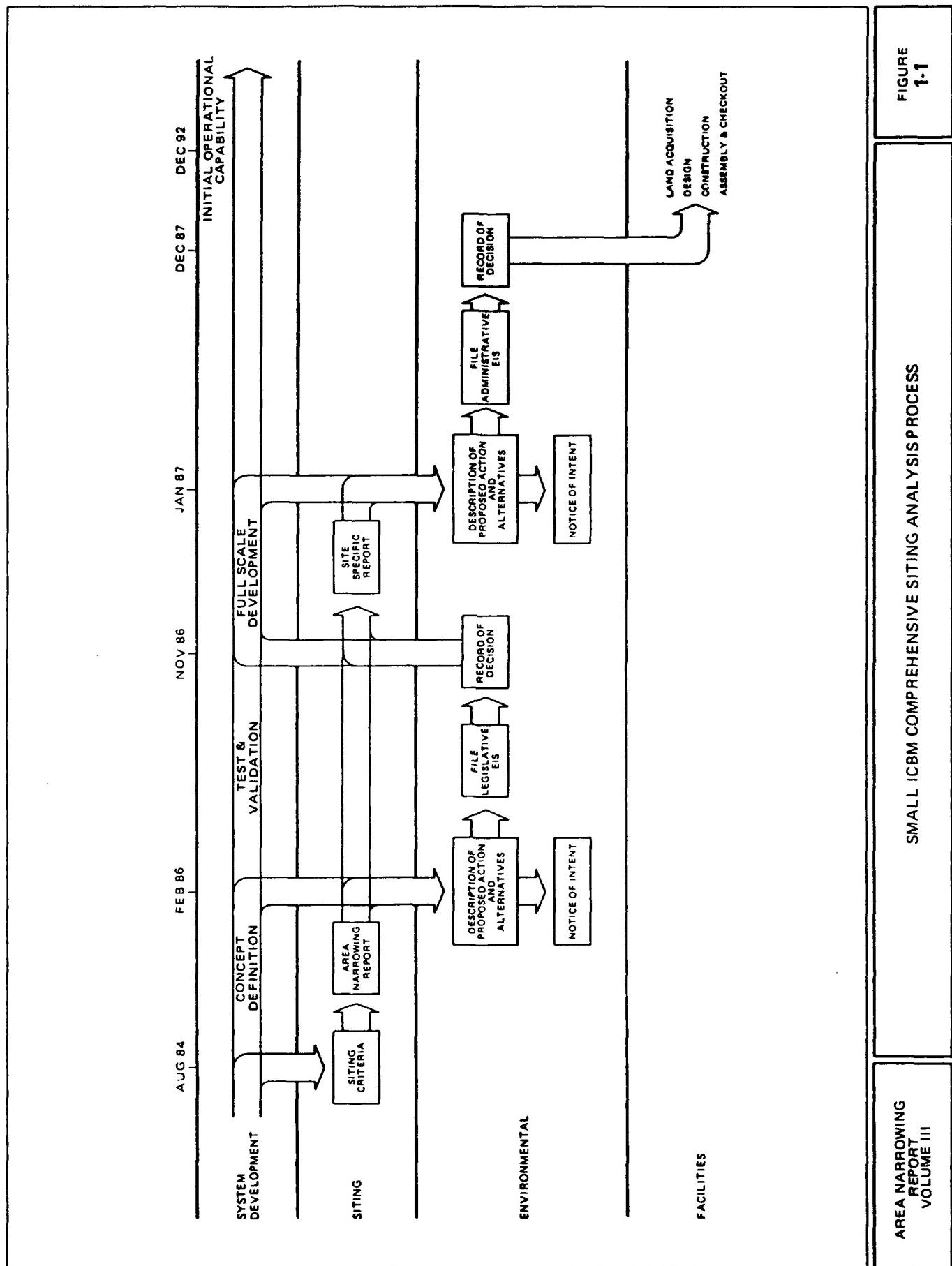
1.2.2 Schedule

A schedule for system siting and environmental analysis is presented in Figure 1-1. Key milestones are: Full Scale Development (FSD) decision (which includes basing mode selection) and Deployment Area selection, late 1986; Site Specific decisions, early 1988; and Initial Operational Capability, late 1992.

1.3 ENVIRONMENTAL IMPACT AND SITING ANALYSIS PROCESS

The National Environmental Policy Act requires environmental documentation to aid the deployment area and site-specific facility decisions. To correlate the detail of decisions with system development progress and for efficiencies in cost and schedule, a tiered approach to the siting aspects of these decisions will be used. The Comprehensive Siting Analysis Process supports tiered decision-making by providing progressively more specific location alternatives at each key decision point.

The first tier involves the deployment area selection and basing mode decision. The FY86 DoD Authorization Act directed that the environmental documentation to aid these



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decisions be prepared in accordance with the procedures established in the Council on Environmental Quality (CEQ) Regulations for a Legislative Environmental Impact Statement (LEIS).

The second tier of decisions requiring environmental documentation involves facility site decisions. The Congress has directed that an Administrative Environmental Impact Statement (EIS) be prepared to aid these decisions. There is no directed date for such decisions. However, environmental documentation will be prepared in time to allow necessary land acquisition, design, construction, and assembly and check-out actions to achieve Initial Operational Capability in late 1992.

2.0 HARD SILO IN PATTERNED ARRAY SYSTEM CONCEPTS

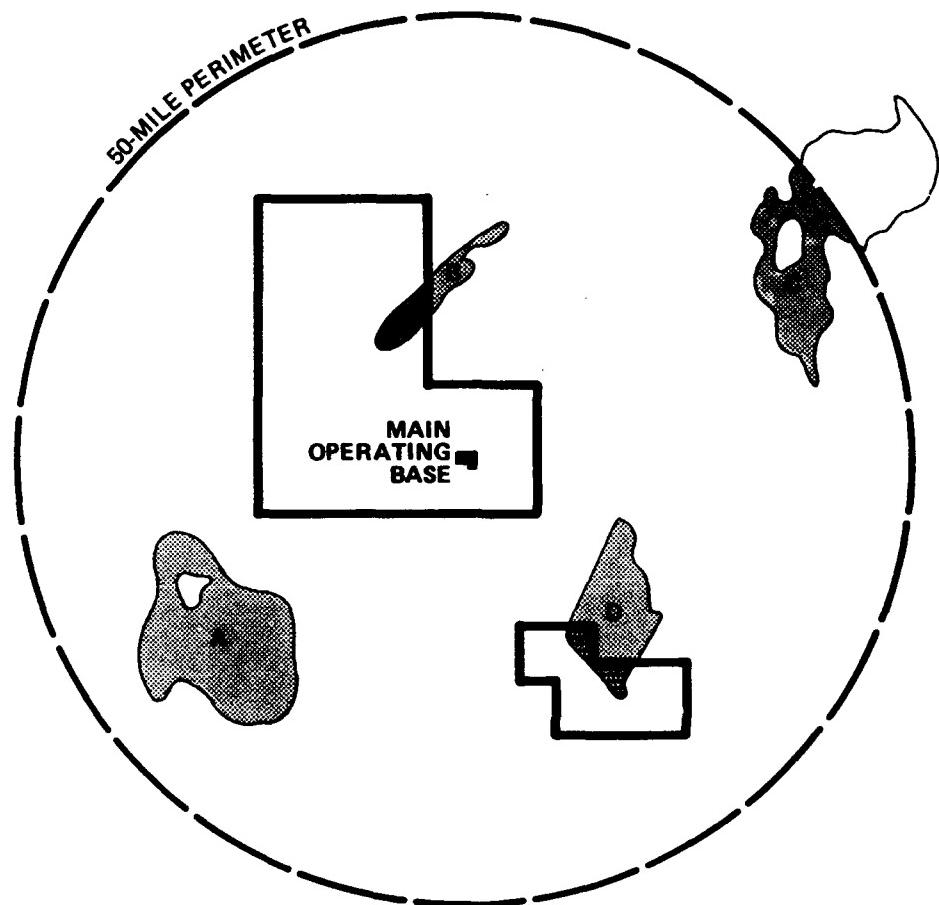
2.1 SYSTEM DESCRIPTION

The Hard Silo in Patterned Array basing mode consists of missiles deployed in superhard silos that may be on or off existing military installations. The survivability of the system is a function of silo hardness and the spacing between silos. The silos are arranged so as to complicate enemy targeting while simplifying maintenance, security, and command and control activities. The system consists of complexes composed of one or more deployment areas and an operating base, interconnected by a transportation network (Figure 2-1). The system will be deployed at one or two complexes, with a minimum of 100 missiles in any one complex. If more than one complex is required, each would be supported by a Main Operating Base.

2.2 OPERATIONAL CONCEPTS

Day-to-day operations primarily take place in the deployment area. The deployment area may contain up to 500 superhard silos, launch control facilities, interconnecting roads, communication systems, a weapons storage area, security, operation and maintenance facilities, and facilities for temporary lodging and life support, all within a fenced perimeter

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EXPLANATION

- DOD INSTALLATION BOUNDARY
- MAIN OPERATING BASE
- SUITABLE AREA PARCEL
- A+B+C+D = DEPLOYMENT AREA
- SUITABLE AREA ON INSTALLATION

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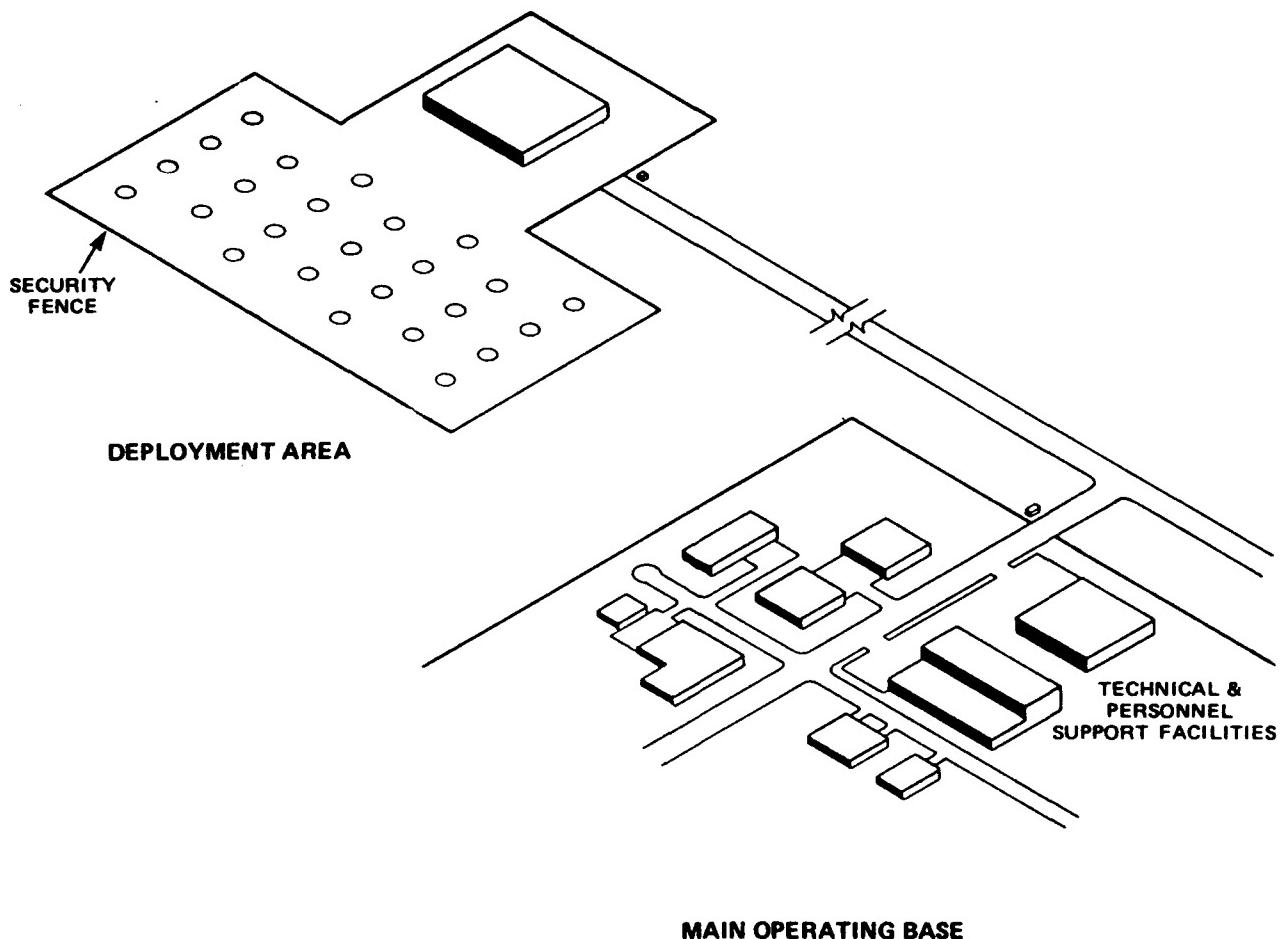
HARD SILO DEPLOYMENT AREA CONCEPT

FIGURE
2-1

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(Figure 2-2). Depending upon the number of locations, about 55 square miles may be required. The operating base facilities will be located at an existing military installation located within 50 miles of the deployment area. Included will be various technical facilities, maintenance shops, training facilities, housing, and base support facilities. To the maximum extent practical, these facilities will be integrated with existing base land uses.

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HARD SILO IN PATTERNED ARRAY BASING MODE

FIGURE
2-2

3.0 COMPREHENSIVE SITING ANALYSIS PROCESS

The Comprehensive Siting Analysis process for Small ICBM area narrowing is a sequential application of Exclusionary and Evaluative Criteria to eliminate unsuitable locations. Each location was evaluated for attainment of key system goals, subgoals, and objectives. Five system goals were defined: maximizing system effectiveness, optimizing system operability, optimizing system practicability, minimizing public impact, and minimizing environmental impacts.

System effectiveness considers the ability of the weapon system to project a credible deterrent against enemy threats. System operability considers the characteristics, capacity, and ability of an installation's facilities and infrastructure to support a new mission. System practicability considers the costs and technical risks associated with construction in the deployment area. Public impact considers people, land use, safety, security, and economic issues. Environmental impacts considers some of the natural and physical characteristics of an area that could change, be altered, or influenced during Small ICBM system deployment.

Within each of these goals, a hierarchical structure of subgoals and objectives was defined. The criteria were developed to reflect the goals, requirements, capabilities,

and constraints of the system and of each basing mode. Application of the criteria demonstrates the ability of a location to support the program goals and objectives. While the approach to each level of criteria application is consistent among basing modes, the criteria are not always identical. As a consequence, a given location may have performed well or poorly, depending upon the basing mode considered for that location.

3.1 EXCLUSIONARY CRITERIA

The first phase in the Area Narrowing process is to eliminate areas that clearly do not meet the minimum requirements of the system. This is accomplished through the application of Exclusionary Criteria, which eliminate from further consideration areas unsuitable for system deployment (see Section 4.0).

Data necessary to support Exclusionary Criteria application were collected to identify areas that did not meet system requirements. Locations remained for further study when the level of data and subsequent analysis did not clearly support their elimination. For this reason, at each subsequent phase in the siting process, a more detailed level of data was collected to evaluate the suitability of those locations that remained.

3.2 EVALUATIVE CRITERIA

All locations that meet the requirements of the Exclusionary

Criteria are, by definition, suitable locations for deployment. The degree of suitability of each location was determined during the second phase of the Area Narrowing process by the application of Evaluative Criteria (see Section 5.0). The purpose of this phase in the siting process was to eliminate locations determined to be unreasonable.

Evaluative Criteria were applied to those locations under consideration for the Hard Silo in Patterned Array basing mode that remained after application of Exclusionary Criteria. Each location was evaluated according to its performance against these criteria. Those locations that were determined to be of lower overall suitability were eliminated from further investigation. Those locations that performed better remain for further analysis.

3.3 SCOPE OF STUDY

Data to support Exclusionary Criteria application were compiled from published documents of federal and state agencies, interpretations of satellite imagery, and/or analysis of topographic maps. The data were compiled onto overlays registered to topographic base maps to delineate the areal extent of excluded area within the potential Deployment Areas. From these maps, suitable siting area was calculated for each potential Deployment Area.

Application of Evaluative Criteria focused on evaluation of existing conditions and activities at both Main Operating

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Bases and the potential Deployment Areas. Previously compiled data were refined and supplemented with the collection and analysis of additional published documents from federal, state, and local agencies, and satellite imagery interpretation. Data collection visits to the Main Operating Bases and aerial and ground reconnaissance surveys of the Deployment Areas were also performed. The ability of each potential Main Operating Base and potential Deployment Area to achieve system goals was used to compare and formulate recommendations for candidate bases that require further study.

4.0 APPLICATION OF EXCLUSIONARY CRITERIA

Exclusionary Criteria define the limits of suitability of a location. These criteria were applied to regions of the United States, Deployment Areas and Main Operating Bases. Alternatives that did not meet each Exclusionary Criterion were eliminated from further analysis.

4.1 EXCLUSIONARY CRITERIA

All five system goals were considered in eliminating locations at this phase of the siting process. These goals reflect constraints dictated by system operational and technical requirements and policy and legal considerations. The hierarchy of Exclusionary Criteria for these goals is provided in Table 4-1. Specific definitions and rationale for each criterion are in Appendix B.

4.2 APPLICATION

This section describes procedures for and sequence of application of criteria to identify regions, Deployment Areas, and Main Operating Bases that meet minimum requirements. Although the Exclusionary Criteria can be distinguished by three levels of geographical concerns, application of these criteria is not as conveniently tiered. The Hard Silo deployment concept induces interdependencies between Main Operating Bases

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TABLE 4-1 HARD SILO IN PATTERNED ARRAY EXCLUSORY CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
<u>1</u> MAXIMIZE SYSTEM EFFECTIVENESS	<u>1.1</u> MAXIMIZE SYSTEM SURVIVABILITY	<u>1.1.1</u> OPTIMIZE ATTACK PRICE	<u>1.1.1.A.1</u> MINIMUM OF 50 SILOS PER PARCEL	MINIMUM PARCEL SIZE
		<u>1.1.2</u> MAXIMIZE HARDNESS	<u>1.1.2.A.1</u> MINIMUM 200 FEET DEPTH TO ROCK	DEPTH TO ROCK
			<u>1.1.2.A.2</u> MINIMUM 200 FEET DEPTH TO WATER	DEPTH TO WATER
<u>2</u> OPTIMIZE SYSTEM OPERABILITY	<u>2.1</u> OPTIMIZE DEPLOYMENT AREA OPERATION	<u>2.1.3</u> MAXIMIZE OPERATION EFFECTIVENESS	<u>2.1.3.A.1</u> MAXIMUM 10 PERCENT SLOPE FOR VEHICLE MOBILITY AND SECURITY	TERRAIN SLOPE
		<u>2.3</u> MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	<u>2.3.1</u> CONSIDER FUNC- TIONAL SUPPORT CAPABILITY	<u>2.3.1.A.1</u> REQUIRE THAT DEPLOYMENT AREA BE WITHIN 50 RADIAL MILES OF THE MAIN OPERATING BASE
			<u>2.3.1.A.2</u> INSTALLATION AREA REQUIRED FOR HARD SILO BEDDOWN GREATER THAN OR EQUAL TO 2/3 SQUARE MILE GROSS AREA	MAIN OPERATING BASE GROSS AREA

TABLE 4-1 HARD SILO IN PATTERNED ARRAY EXCLUSIONARY CRITERIA

Page 2 of 3

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
2 (cont'd) OPTIMIZE SYSTEM OPERABILITY	2.3 (cont'd) MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.1 (cont'd) CONSIDER FUNCTIONAL SUPPORT CAPABILITY	2.3.1.A.3 <u>EXCLUDE MOBS WITHIN URBANIZED AREAS</u>	URBANIZED AREA SURROUNDING MAIN OPERATING BASE
		2.3.1.A.4 <u>EXCLUDE INAPPROPRIATE MAIN OPERATING BASES</u>		SUITABLE EXISTING DEPARTMENT OF DEFENSE INSTALLATIONS
		3.2.1 <u>OPTIMIZE CONSTRUCTIBILITY</u>	3.2.1.A.1 <u>MINIMIZE DEPLOYMENT COSTS</u>	AVAILABLE DEPLOYMENT AREA
3	OPTIMIZE SYSTEM PRACTICABILITY			
4	MINIMIZE PUBLIC IMPACT	4.1 <u>MINIMIZE ECONOMIC IMPACTS</u>	4.1.1 <u>AVOID HIGH-VALUE LAND</u>	4.1.1.A.1 <u>AVOID URBANIZED AREAS</u>
			4.1.2 <u>AVOID HIGH-VALUE ECONOMIC RESOURCES</u>	4.1.2.A.1 <u>AVOID CONFLICTS WITH VALUABLE ENERGY RESOURCE AREAS</u>
5	MINIMIZE ENVIRONMENTAL IMPACTS	5.3 <u>MINIMIZE IMPACT ON SPECIAL STATUS LANDS</u>	5.3.1 <u>EXCLUDE LEGAL/REGULATORY EXCLUSION AREAS</u>	5.3.1.A.1 <u>EXCLUDE LANDS WITHIN WILDERNESS AREAS</u>

TABLE 4-1 HARD SILO IN PATTERNED ARRAY EXCLUSIONARY CRITERIA

Page 3 of 3

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
5 (cont'd) MINIMIZE ENVIRONMENTAL IMPACTS	5.3 (cont'd) MINIMIZE IMPACT ON SPECIAL STATUS LANDS	5.3.1 (cont'd) EXCLUDE LEGAL/REGULATORY EXCLUSION AREAS	5.3.1.A.2 EXCLUDE LANDS WITHIN NATIONAL AND STATE MONUMENTS	NATIONAL AND STATE MONUMENTS
			5.3.1.A.3 EXCLUDE LANDS WITHIN NATIONAL RECREATION AREAS	NATIONAL RECREATION AREAS
			5.3.1.A.4 EXCLUDE LANDS WITHIN NATIONAL AND STATE PARKS	NATIONAL AND STATE PARKS
			5.3.1.A.5 EXCLUDE LANDS WITHIN WILD AND SCENIC RIVERS SYSTEM	WILD AND SCENIC RIVERS SYSTEM
			5.3.1.A.6 EXCLUDE AREA IN AMERICAN INDIAN RESERVATIONS	AMERICAN INDIAN RESERVATIONS
			5.3.1.A.7 EXCLUDE LANDS WITHIN WILDLIFE REFUGES AND GAME PRESERVES	WILDLIFE REFUGES AND GAME PRESERVES

and Deployment Areas. These interdependencies are illustrated by the Deployment Area Exclusionary Criterion that requires the Deployment Area to be within 50 miles of a Main Operating Base. An additional Deployment Area Exclusionary Criterion requires that a minimum of 100 silos be deployed per Main Operating Base. In addition, there is a Main Operating Base Exclusionary Criterion that requires sufficient land for additional facilities to support the Hard Silo mission. Recognition of these interdependencies is extremely important in the development of a logical sequence of criteria application. For example, eliminating a potential Main Operating Base may cause the deployment area within 50 miles of the base to be eliminated. Similarly, if the area required to deploy 100 silos is not available, the potential Main Operating Base would be eliminated from further consideration. Eliminating this Main Operating Base would remove each of the potential deployment areas within 50 miles from consideration unless that deployment area is supported by another potential Main Operating Base. This iterative process is diagrammatically represented in Figure 4-1 and described in Steps 1 through 9 that follow. This description of the application of the Exclusionary Criteria is followed by a series of figures and tables

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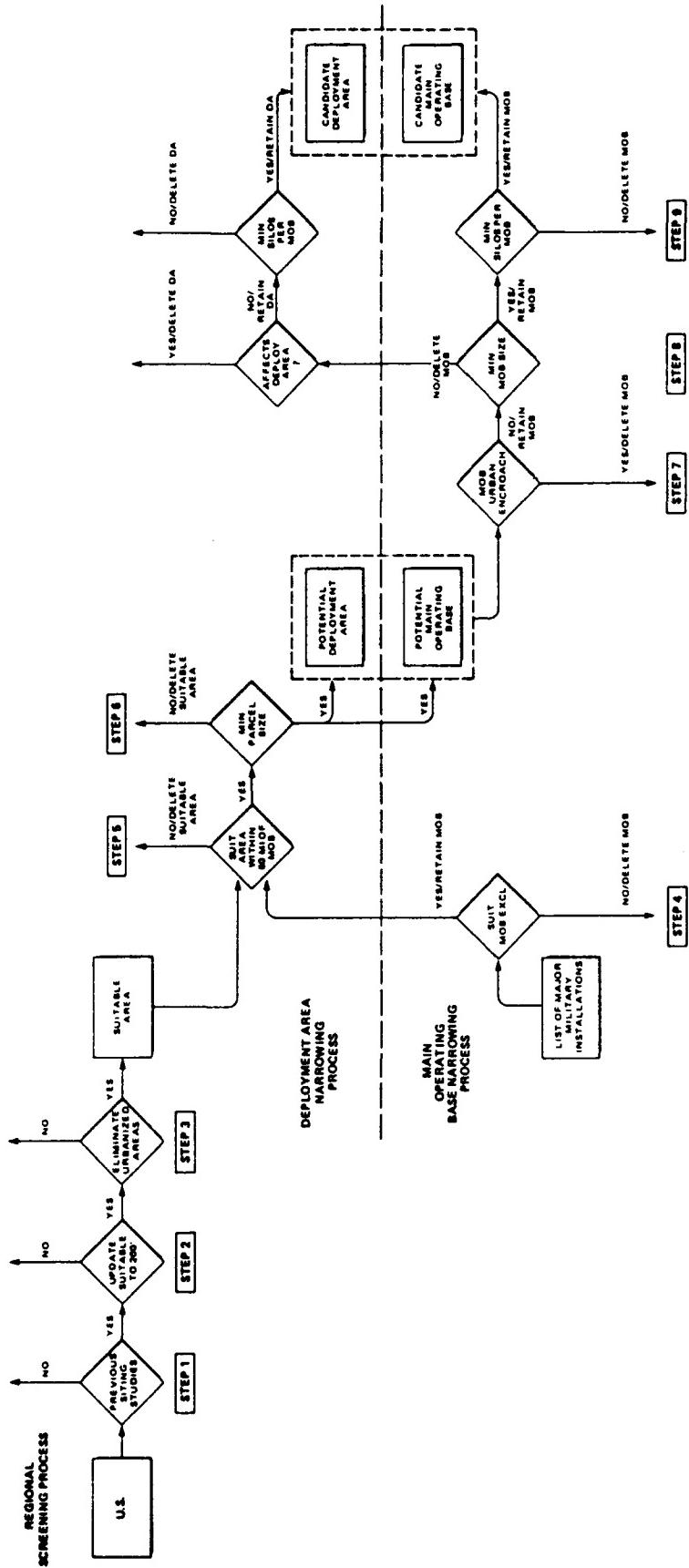


FIGURE
4-1

HARD SILO CRITERIA APPLICATION SEQUENCE

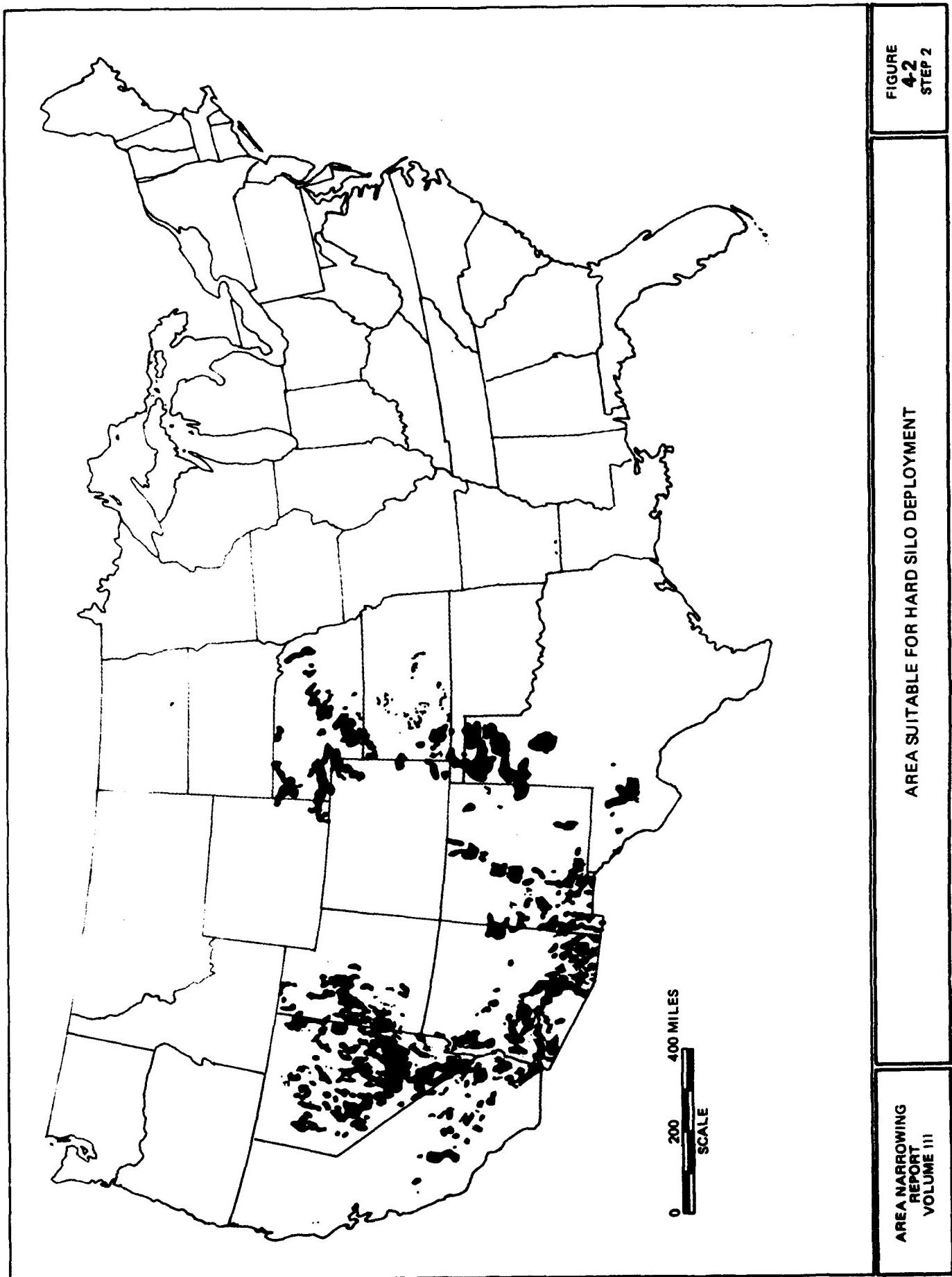
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that illustrate which installations meet, and which installations do not meet, the requirements for each criterion.

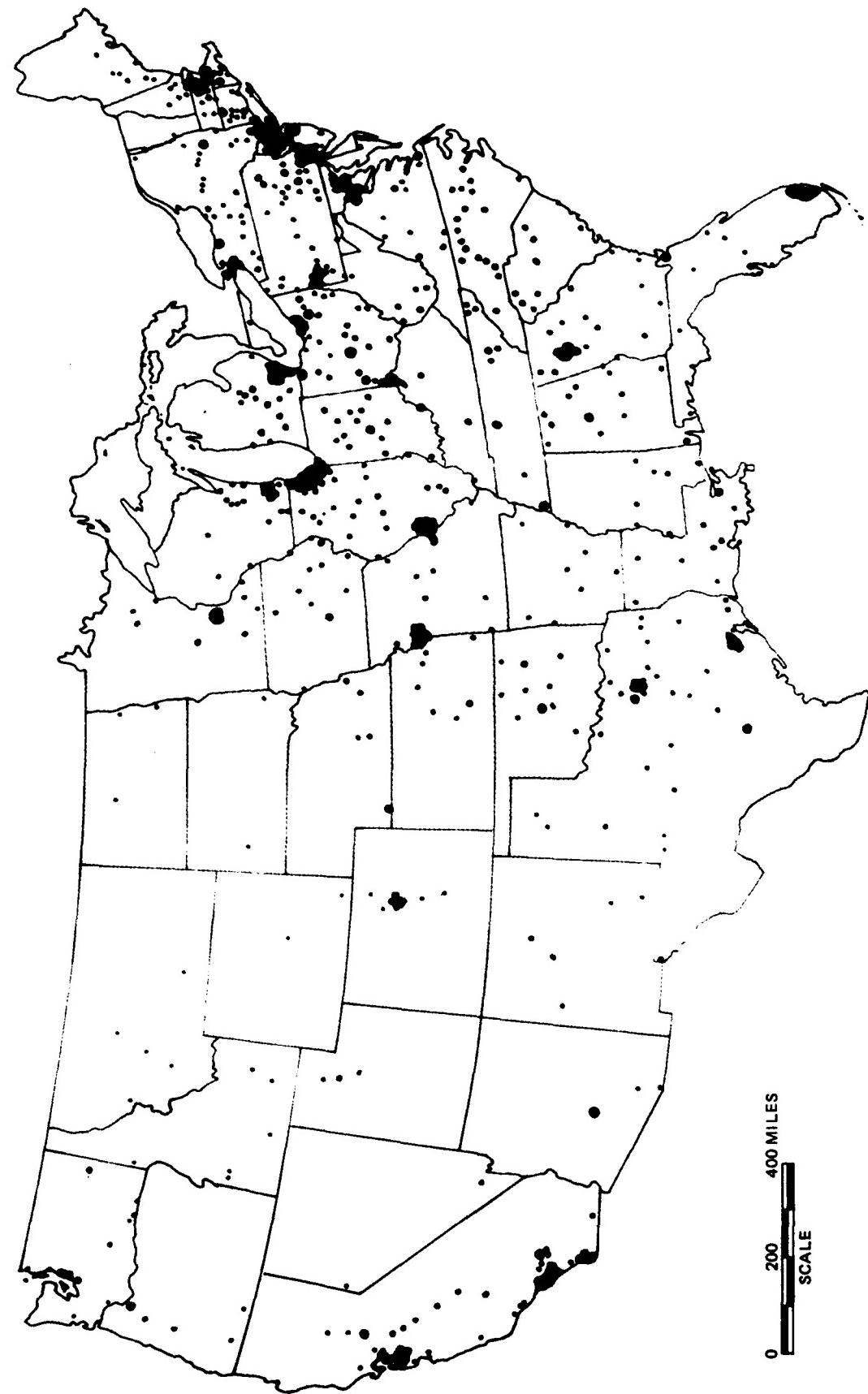
- STEP 1: Data collected for previous siting studies were utilized to reduce the number of suitable areas, which were defined as having a minimum of 150 foot depth to rock and water, slope of 10 percent or less, and excluding legal and policy exclusions.
- STEP 2: Deployment Area Exclusionary Criteria requiring a minimum of 200 feet to rock and water (1.1.2.A.1 and 1.1.2.A.2) and policy and legal exclusions (2.1.3.A.1, 4.1.2.A.1, 5.3.1.A.1, 5.3.1.A.2, 5.3.1.A.3, 5.3.1.A.4, 5.3.1.A.5, 5.3.1.A.6, and 5.3.1.A.7) further refined the area suitable for Hard Silo deployment (see Figure 4.2).
- STEP 3: The urbanized area Exclusionary Criterion (4.1.1.A.1) eliminated suitable areas falling within the boundaries of urbanized areas (see Figure 4-3).
- STEP 4: Exclusionary Criterion 2.3.1.A.4, requiring that the support base be a suitable Department of Defense installation with existing facilities, narrowed Department of Defense lands classified as major military installations to bases appropriate as a Main Operating Base (see Appendix A).
- STEP 5: Exclusionary Criterion 2.3.1.A.1 eliminated Main Operating Bases that do not have suitable area within 50 radial miles (see Appendix A). The remaining Main Operating Bases are presented in Figure 4-4 and Table 4-2.
- STEP 6: Exclusionary Criterion 1.1.1.A.1, which requires a minimum of 50 silos per parcel, excluded parcels with less than 5 square miles of suitable area. Potential Main Operating Bases with no parcels 5 square miles or larger were eliminated (see Figure 4-5 and Table 4-3).

- STEP 7:** Applying the Exclusionary Criterion that a Main Operating Base not be surrounded by an urbanized area (2.3.1.A.3), potential Main Operating Bases, the boundaries of which fall completely within an urbanized area, were eliminated (see Figure 4-6 and Table 4-4).
- STEP 8:** Potential Main Operating Bases with a gross size of less than 2/3 square miles were eliminated (Criterion 2.3.1.A.2) (see Figure 4-7 and Table 4-5).
- STEP 9:** Potential Main Operating Bases that cannot support a minimum of 100 silos were eliminated (Criterion 3.2.1.A.1). Experience indicates that the net suitable area after avoiding environmental and socioeconomic impacts is about one half of the gross suitable area. Potential Main Operating Bases with less than 20 square miles of gross suitable area within 50 radial miles were eliminated (see Figure 4-8 and Table 4-6).

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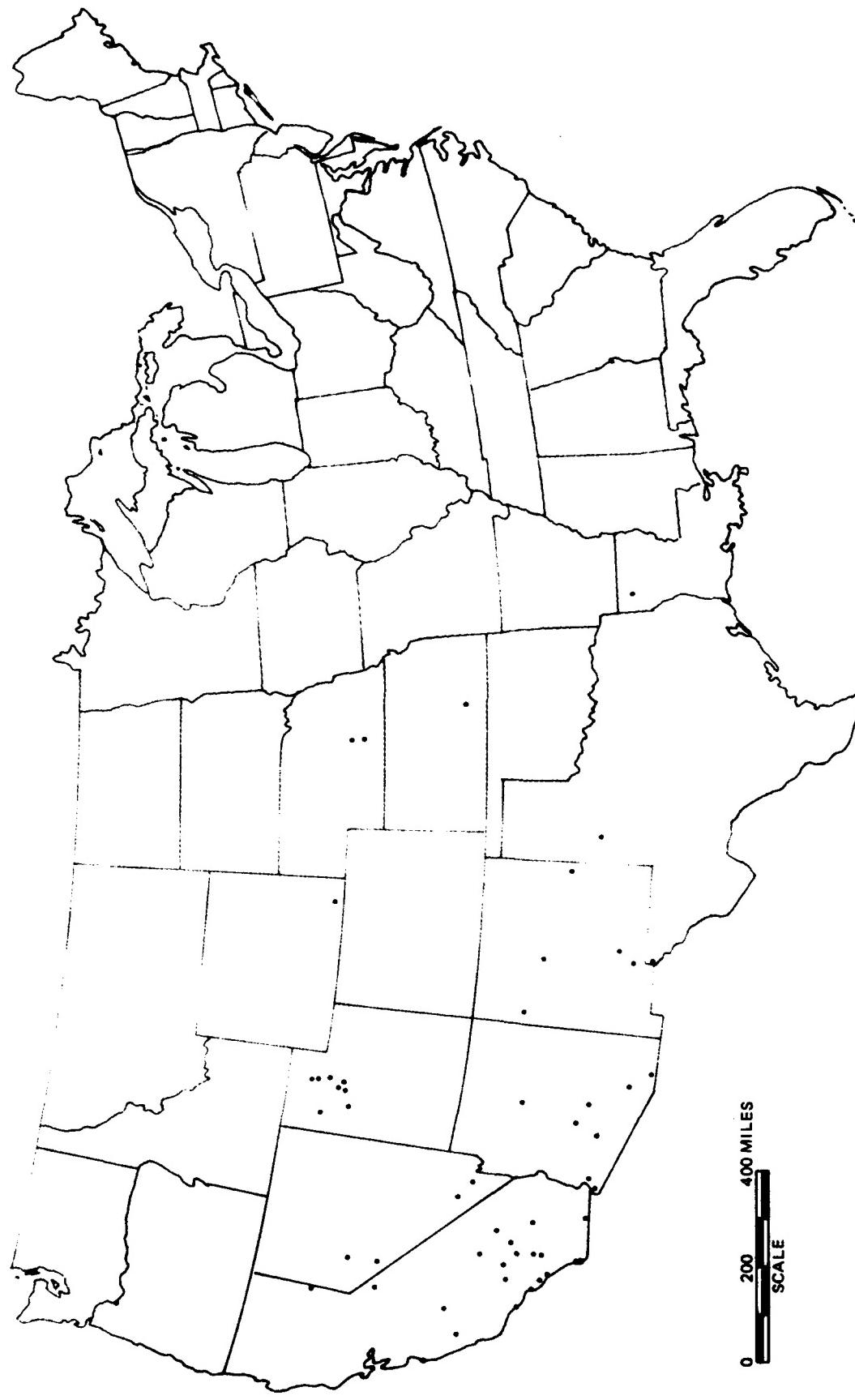


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URBANIZED AREAS

FIGURE
4-3
STEP 3

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MAIN OPERATING BASES WITH SUITABLE AREA WITHIN 50 RADIAL MILES

FIGURE
4-4
STEP 6

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TABLE 4-2 STEP 5: MAIN OPERATING BASES WITH SUITABLE AREA WITHIN 50 RADIAL MILES

STATE	INSTALLATION	OPERATING SERVICE	STATE	INSTALLATION	OPERATING SERVICE	STATE	INSTALLATION	OPERATING SERVICE
AZ	DAVIS-MONTHAN AIR FORCE BASE	AF	CA	SAN FRANCISCO NAVAL BASE	NAVY	CA	SEAL BEACH WEAPONS STA	NAVY
AZ	FORT HUACHUCA	ARMY	CA	SIERRA ARMY DEPOT	ARMY	CA	WEAPONS TEST CENTER, BRIDGEPORT	USMC
AZ	GILA BEND AF AUX FIELD	AF	CA	MCCONNELL AIR FORCE BASE	AF	KS	LOUISIANA AMMO PLANT	ARMY
AZ	LUKE AIR FORCE BASE	USMC	LA	CORNHUSKER ARMY AMMO PLANT	ARMY	LA	HASTINGS NATL GUARD FAC	NG
AZ	MARINE CORPS AIR STATION, YUMA	ARMY	NE	CANNON AIR FORCE BASE	AF	NE	CANNON AIR FORCE BASE	ARMY
AZ	NAVAJO DEPOT ACTIVITY	AF	NM	FORT WINGATE DEPOT ACTIVITY	AF	NM	HOLLOWAY AIR FORCE BASE	AF
AZ	WILLIAMS AIR FORCE BASE	ARMY	NM	KIRTLAND AIR FORCE BASE	AF	NM	WHITE SANDS MISSILE RANGE	ARMY
AZ	YUMA PROVING GROUND	ARMY	NM	WHITE SANDS MISSILE RANGE	AF	NM	FALLON NAVAL AIR STATION	NAVY
CA	ALAMEDA NAVAL AIR STATION	NAVY	NV	HAWTHORNE ARMY AMMUNITION PLANT	ARMY	NV	INDIAN SPRINGS AF AUX FIELD	AF
CA	CAMP ROBERTS	NG	NV	HELLER AIR FORCE BASE	AF	NV	HELLIS AIR FORCE BASE	AF
CA	CHINA LAKE NMIC	NAVY	OR	PORTLAND NAVAL RES CENTER	NAVY	OR	PORT BLISS	ARMY
CA	EDWARDS AIR FORCE BASE	AF	TX	REFGE AIR FORCE BASE	AF	TX	CAMP WILLIAMS	NG
CA	EL CENTRO NAVAL AIR FACILITY	NAVY	TX	DUGWAY PROVING GROUND	ARMY	UT	DUGWAY PROVING GROUND	ARMY
CA	FORT BAKER EAST	ARMY	UT	PORT DOUGLAS	AF	UT	PORT DOUGLAS	AF
CA	FORT IRWIN	AF	UT	HILL AIR FORCE BASE	AF	UT	HILL AIR FORCE BASE	AF
CA	FORT MACARTHUR	ARMY	UT	HILL AIR FORCE RANGE	AF	UT	HILL AIR FORCE RANGE	AF
CA	GEORGE AIR FORCE BASE	AF	UT	OGDEN DEFENSE DEPOT	ARMY	UT	OGDEN DEFENSE DEPOT	ARMY
CA	LEMOORE NAVAL AIR STATION	NAVY	UT	TOELE ARMY DEPOT NORTH	ARMY	UT	TOELE ARMY DEPOT NORTH	ARMY
CA	LOS ANGELES AFS	AF	UT	TOELE ARMY DEPOT SOUTH	ARMY	UT	TOELE ARMY DEPOT SOUTH	ARMY
CA	MARCH AIR FORCE BASE	USMC	NY	F.E. WARREN AIR FORCE BASE	AF	NY	F.E. WARREN AIR FORCE BASE	AF
CA	MARINE CORPS AIR STATION, TUSTIN	USMC						
CA	MC LOGISTICS BASE, BARSTOW	USMC						
CA	MCAGCC TWENTYNINE PALMS	USMC						
CA	MONTREY POSTGRADUATE SCHOOL	NAVY						
CA	NORTON AIR FORCE BASE	AF						
CA	OAKLAND ARMY BASE	ARMY						
CA	PORT HUENEME CONST. BATTALION CTR	NAVY						
CA	SAN DIEGO FLEET ANTISUB WARP TRN CT	NAVY						
CA	SAN DIEGO FLIGHT TRAINING CTR	NAVY						

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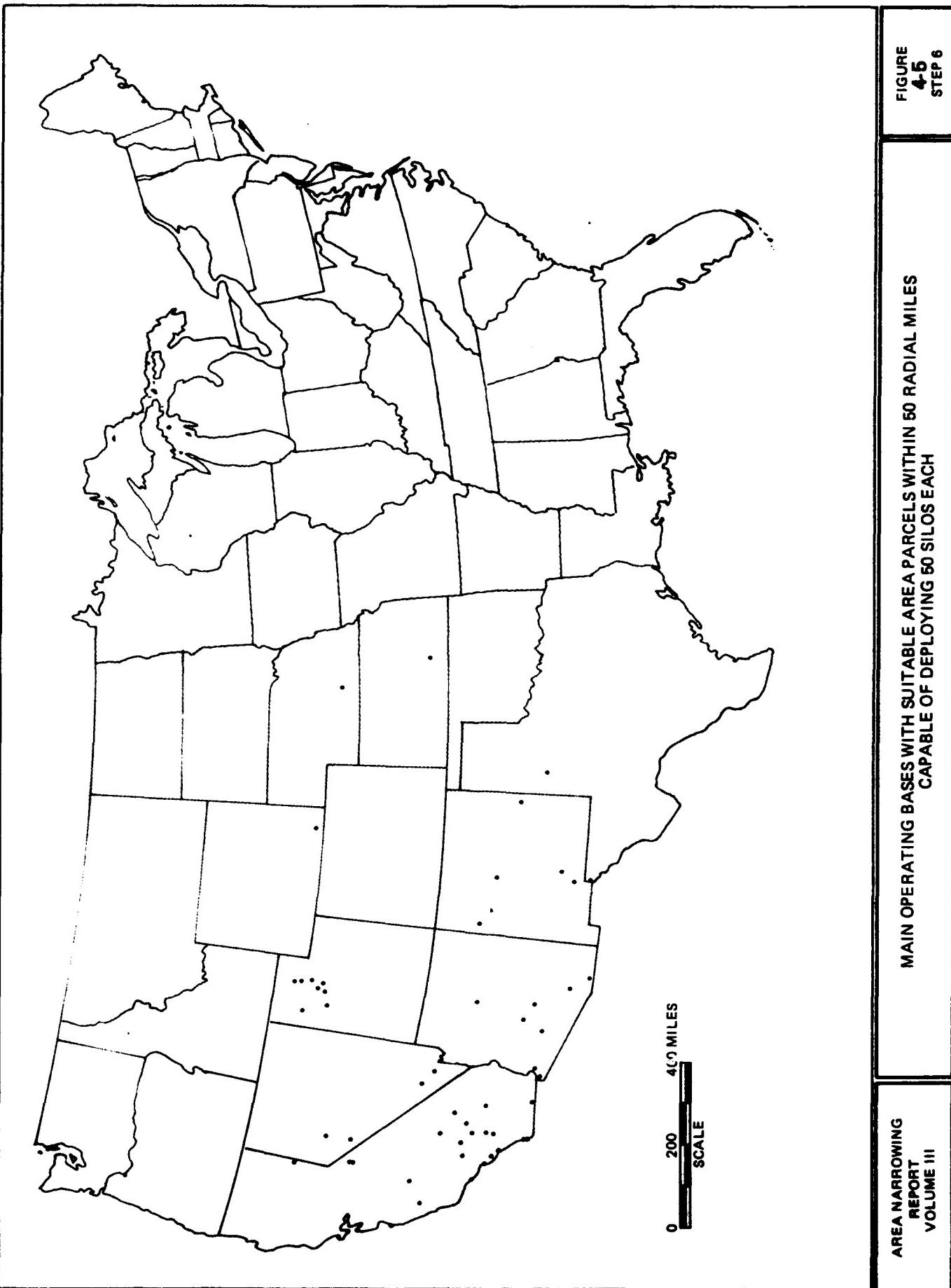


TABLE 4-3 STEP 6: MAIN OPERATING BASES WITH SUITABLE PARCELS WITHIN 50 RADIAL MILES CAPABLE OF DEPLOYING 50 SILOS EACH

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>
A2	DAVIS-MONTHAN AIR FORCE BASE	AF	CA	SAN FRANCISCO NAVAL BASE	NAVY
A2	FORT HUACHUCA	ARMY	CA	SEAL BEACH WEAPONS STA	NAVY
A2	GILA BEND AF AUX FIELD	AF	CA	SIERRA ARMY DEPOT	ARMY
A2	LUKE AIR FORCE BASE	AF	CA	WEAPONS TEST CENTER, BRIDGEPORT	USMC
A2	MARINE CORPS AIR STATION, YUMA	USMC	KS	MCCONNELL AIR FORCE BASE	AF
A2	NAVAJO DEPOT ACTIVITY	ARMY	LA	LOUISIANA AMMO PLANT	ARMY
A2	WILLIAMS AIR FORCE BASE	AF	NS	CORNHUSKER ARMY AMMO PLANT	ARMY
A2	YUMA PROVING GROUND	ARMY	NE	HASTINGS NATL GUARD FAC	NG
CA	ALAMEDA NAVAL AIR STATION	NAVY	NM	CANNON AIR FORCE BASE	AF
CA	CAMP ROBERTS	NAVY	NM	FORT WINGATE DEPOT ACTIVITY	ARMY
CA	CHINA LAKE NMC	NAVY	NM	HOLLOWAY AIR FORCE BASE	AF
CA	EDWARDS AIR FORCE BASE	AF	NM	KIRTLAND AIR FORCE BASE	AF
CA	EL CENTRO NAVAL AIR FACILITY	NAVY	NM	WHITE SANDS MISSILE RANGE	ARMY
CA	FORT BAKER EAST	ARMY	NV	FALON NAVAL AIR STATION	NAVY
CA	FORT IRWIN	ARMY	NV	HAWTHORNE ARMY AMMUNITION PLANT	ARMY
CA	FORT MACARTHUR	ARMY	NV	INDIAN SPRINGS AF AUX FIELD	AF
CA	GEORGE AIR FORCE BASE	AF	NV	NEILLIS AIR FORCE BASE	AF
CA	LEMOORE NAVAL AIR STATION	NAVY	OR	PORTLAND NAVAL RES CENTER	ARMY
CA	LOS ANGELES AFS	AF	TX	FORT BLISS	AF
CA	MARCH AIR FORCE BASE	AF	TX	RESE Air Force Base	AF
CA	MARINE CORPS AIR STATION, TUSTIN	USMC	UT	CAMP WILLIAMS	NG
CA	MC LOGISTICS BASE, BARSTOW	USMC	UT	DUGWAY PROVING GROUND	ARMY
CA	MCAGCC TWENTYNINE PALMS	USMC	UT	PORT DOUGLAS	ARMY
CA	MONTREY POSTGRADUATE SCHOOL	NAVY	UT	HILL AIR FORCE BASE	AF
CA	NORTON AIR FORCE BASE	AF	UT	HILL AIR FORCE RANGE	AF
CA	OAKLAND ARMY BASE	ARMY	UT	OGDEN DEFENSE DEPOT	ARMY
CA	PORTE HUENEME CONST. BATTALION CTR	NAVY	UT	TOELE ARMY DEPOT NORTH	ARMY
CA	PORTE DIEGO FLEET ANTISUB WARP TRN CT	NAVY	UT	TOELE ARMY DEPOT SOUTH	ARMY
CA	SAN DIEGO FLIGHT TRAINING CTR	NAVY	WY	F.E. WARREN AIR FORCE BASE	AF

BASES ELIMINATED

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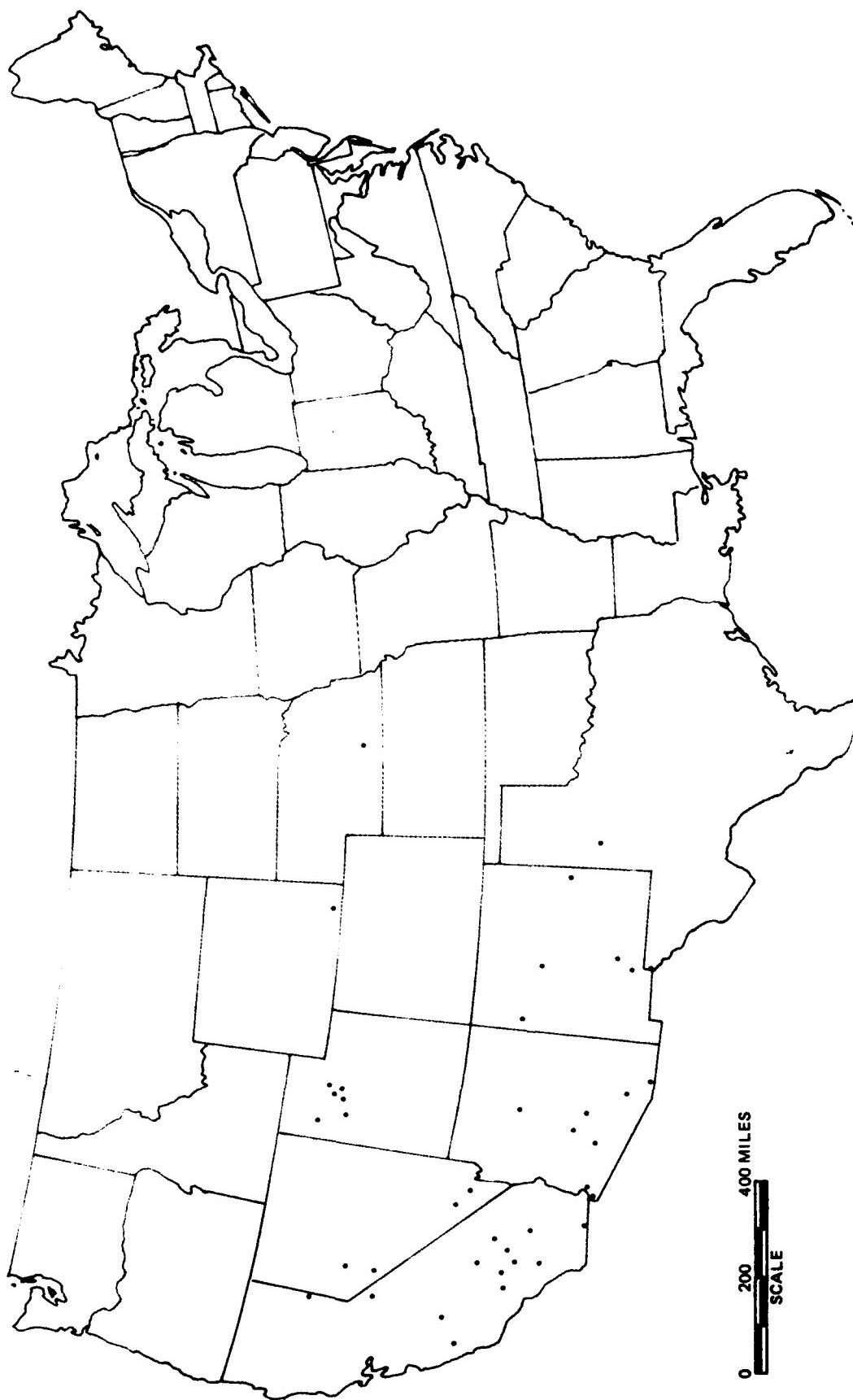


FIGURE
4-6
STEP 7

MAIN OPERATING BASES NOT SURROUNDED BY URBAN AREA

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TABLE 4-4 STEP 7: MAIN OPERATING BASES NOT SURROUNDED BY URBAN AREA

OPERATING SERVICE		STATE	INSTALLATION	STATE	INSTALLATION
STATE	OPERATING SERVICE	STATE	OPERATING SERVICE	STATE	OPERATING SERVICE
AZ	DAVIS-MONTHAN AIR FORCE BASE	CA	SAN DIEGO FLIGHT TRAINING CTR	CA	SAN DIEGO FLIGHT TRAINING CTR
AZ	PORT HUACHUA	CA	SAN FERNANDO NAVAL BASE	CA	SAN FERNANDO NAVAL BASE
AZ	GILA BEND AF AUX FIELD	CA	SEAL BEACH WEAPONS STA	CA	SEAL BEACH WEAPONS STA
AZ	LURE AIR FORCE BASE	CA	SIERRA ANTI DROPOUT	CA	SIERRA ANTI DROPOUT
AZ	MARINE CORPS AIR STATION, YUMA	CA	WEAPONS TEST CENTER, BRIDGEPORT	CA	WEAPONS TEST CENTER, BRIDGEPORT
AZ	NAVAJO DEPOT ACTIVITY	CA	WICHITA FALLS AIR FORCE BASE	CA	WICHITA FALLS AIR FORCE BASE
AZ	WILLIAMS AIR FORCE BASE	CA	HASTINGS NATL GUARD FAC	CA	HASTINGS NATL GUARD FAC
AZ	YUMA PROVING GROUND	CA	CANNON AIR FORCE BASE	CA	CANNON AIR FORCE BASE
CA	EL PASO AIR NATIONAL GUARD BASE	CA	PORT WINGATE DEPOT ACTIVITY	CA	PORT WINGATE DEPOT ACTIVITY
CA	INDIAN SPRINGS AIR STATION	CA	HOLLOWAY AIR FORCE BASE	CA	HOLLOWAY AIR FORCE BASE
CA	CHINA LAKE NMIC	CA	KIRTLAND AIR FORCE BASE	CA	KIRTLAND AIR FORCE BASE
CA	EDWARDS AIR FORCE BASE	CA	WHITE SANDS MISSILE RANGE	CA	WHITE SANDS MISSILE RANGE
CA	EL CENTRO NAVAL AIR FACILITY	CA	PALOMA NAVAL AIR STATION	CA	PALOMA NAVAL AIR STATION
CA	FOUNTAIN DALES	CA	HAWTHORNE ARMY AMMUNITION PLANT	CA	HAWTHORNE ARMY AMMUNITION PLANT
CA	PORT IRWIN	CA	INDIAN SPRINGS AP AUX FIELD	CA	INDIAN SPRINGS AP AUX FIELD
CA	FORT MACARTHUR	CA	NELLIS AIR FORCE BASE	CA	NELLIS AIR FORCE BASE
CA	GEORGE AIR FORCE BASE	CA	PORTLAND NAVAL REE CENTER	CA	PORTLAND NAVAL REE CENTER
CA	LEMOORE NAVAL AIR STATION	TX	PORT BLISS	TX	PORT BLISS
CA	LEWISTON AIR FORCE BASE	TX	REESE AIR FORCE BASE	TX	REESE AIR FORCE BASE
CA	MARCH AIR FORCE BASE	UT	CAMP WILLIAMS	UT	CAMP WILLIAMS
CA	MATTHEWS COAST AIR STATION, JUSTIN	UT	DUGWAY PROVING GROUND	UT	DUGWAY PROVING GROUND
CA	MC LOGISTICS BASE, BARSTOW	UT	FORT DOUGLAS	UT	FORT DOUGLAS
CA	MCAGCC TWENTYNINE PALMS	UT	HILL AIR FORCE BASE	UT	HILL AIR FORCE BASE
CA	MONTGOMERY POINT LOGISTICS CENTER	UT	HILL AIR FORCE RANGE	UT	HILL AIR FORCE RANGE
CA	NEWTON AIR FORCE BASE	UT	ODER DEFENSE INST	UT	ODER DEFENSE INST
CA	OAKLAND ARMY BASE	UT	TOOELE ARMY DEPOT NORTH	UT	TOOELE ARMY DEPOT NORTH
CA	PORT BURGESS COAST	UT	TOOELE ARMY DEPOT SOUTH	UT	TOOELE ARMY DEPOT SOUTH
CA	SAN DIEGO SIGHT AND SURVEY MAP	WY	F.E. WARREN AIR FORCE BASE	WY	F.E. WARREN AIR FORCE BASE

BASES ELIMINATED

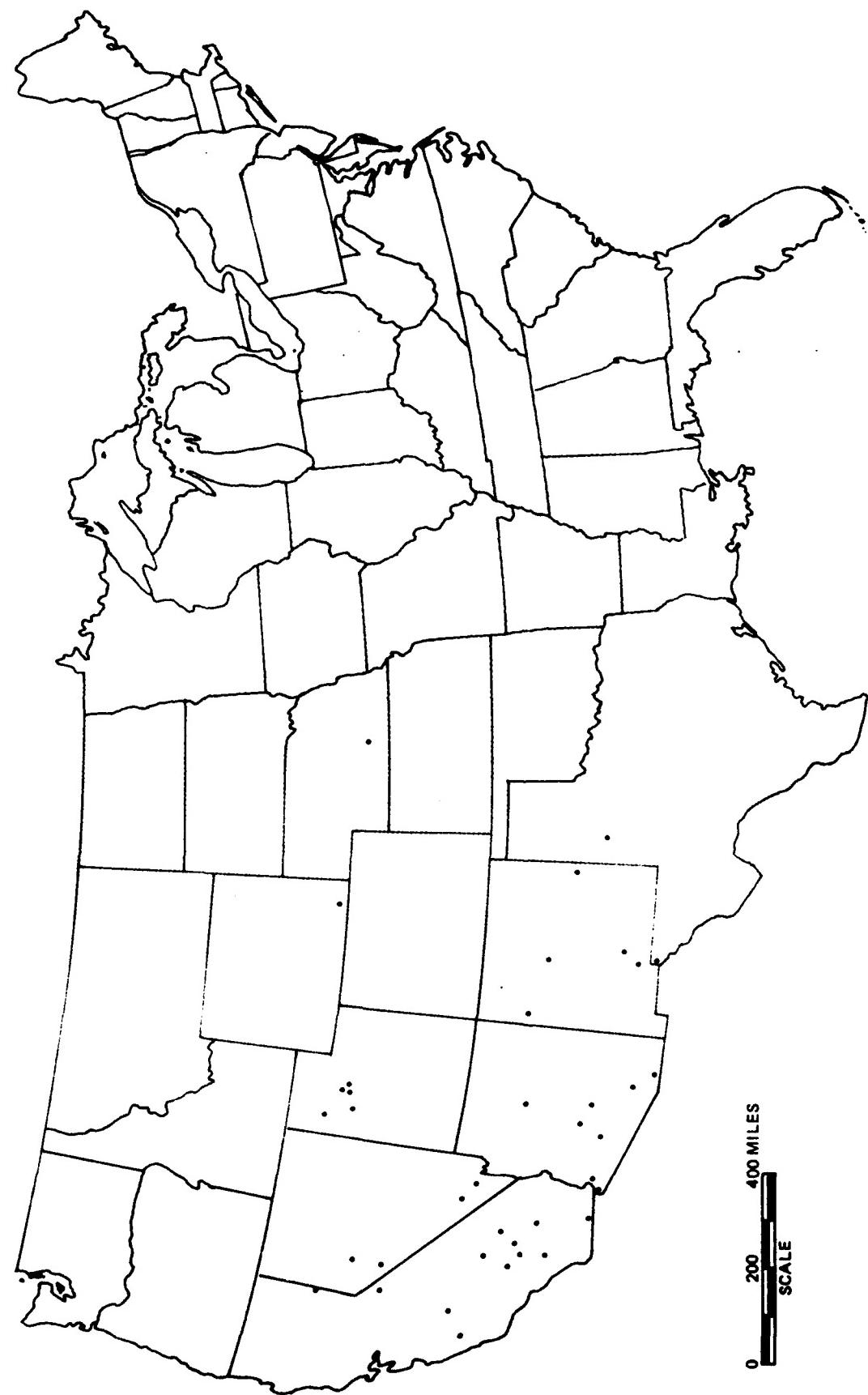
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FIGURE
47
STEP 8

MAIN OPERATING BASES WITH GREATER THAN OR EQUAL TO 2/3 SQUARE MILE GROSS AREA

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0 200 400 MILES
SCALE



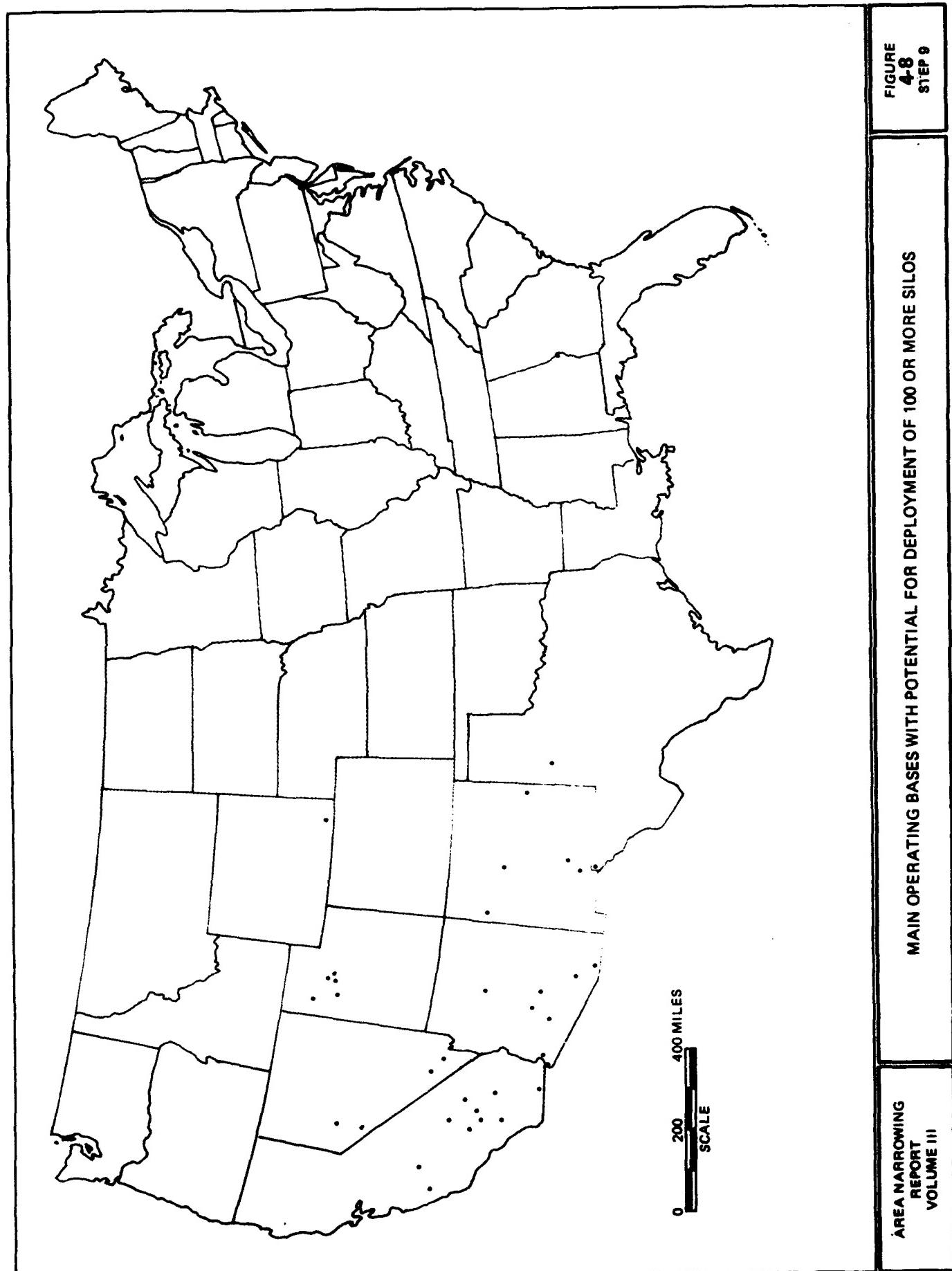
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**TABLE 4-5 STEP 8: MAIN OPERATING BASES WITH GREATER THAN
OR EQUAL TO 2/3 SQUARE MILE GROSS AREA**

<u>STATE</u>	<u>INSTALLATION</u>	<u>BASE SIZE SO. MI.</u>	<u>OPERATING SERVICE</u>
AZ	DAVIS-MONTHAN AIR FORCE BASE	17	AF
AZ	FORT HUACHUCA	115	ARMY
AZ	GILA BEND AF AUX FIELD	3	AF
AZ	LUKE AIR FORCE BASE	7	AF
AZ	MARINE CORPS AIR STATION, YUMA	5	USMC
AZ	NAVAJO DEPOT ACTIVITY	44	ARMY
AZ	WILLIAMS AIR FORCE BASE	7	AF
AZ	YUMA PROVING GROUND	1310	ARMY
CA	CAMP ROBERTS	68	NG
CA	CHINA LAKE NAVAL WEAPONS CENTER	1714	NAVY
CA	EDWARDS AIR FORCE BASE	470	AF
CA	EL CENTRO NAVAL AIR FACILITY	4	NAVY
CA	FORT IRWIN	1062	ARMY
CA	FORT MCNAUL	< 1	ARMY
CA	GEORGE AIR FORCE BASE	8	AF
CA	LEMOORE NAVAL AIR STATION	29	NAVY
CA	MARCH AIR FORCE BASE	11	AF
CA	MC LOGISTICS BASE, BARSTOW	9	USMC
CA	MCAGCC TWENTYNINE PALMS	932	USMC
CA	SIERRA ARMY DEPOT	57	ARMY
CA	WEAPONS TEST CENTER, BRIDGEPORT	5	USMC
NE	HASTINGS NAT'L GUARD FAC	5	NG
NM	CANNON AIR FORCE BASE	7	AF
NM	FORT WINGATE DEPOT ACTIVITY	35	ARMY
NM	HOLLOWMAN AIR FORCE BASE	75	AF
NM	KIRTLAND AIR FORCE BASE	82	AF
NM	WHITE SANDS MISSILE RANGE	3046	ARMY
NV	FALLOON NAVAL AIR STATION	12	NAVY
NV	HAWTHORNE ARMY AMMUNITION PLANT	230	ARMY
NV	INDIAN SPRINGS AF AUX FIELD	4	AF
NV	NELLIS AIR FORCE BASE	18	AF
TX	PORT BLISS	1750	ARMY
TX	REESE AIR FORCE BASE	4	AF
UT	CAMP WILLIAMS	36	NG
UT	DUGWAY PROVING GROUND	1246	ARMY
UT	FORT DODGE	< 1	ARMY
UT	HILL AIR FORCE RANGE	573	AF
UT	TOOELE ARMY DEPOT NORTH	39	ARMY
UT	TOOELE ARMY DEPOT SOUTH	30	ARMY
WY	F.E. WARREN AIR FORCE BASE	9	AF

BASES ELIMINATED

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MAIN OPERATING BASES WITH POTENTIAL FOR DEPLOYMENT OF 100 OR MORE SILOS

FIGURE
4-8
STEP 9

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**TABLE 4-6 STEP 9: MAIN OPERATING BASES WITH POTENTIAL
FOR DEPLOYMENT OF 100 OR MORE SILOS**

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>
AZ	DAVIS-MONTHAN AIR FORCE BASE	AF
AZ	FORT Huachuca	ARMY
AZ	GILA BEND AF AUX FIELD	AF
AZ	LUKE AIR FORCE BASE	AF
AZ	MARINE CORPS AIR STATION, YUMA	USMC
AZ	NAVAJO DEPOT ACTIVITY	ARMY
AZ	WILLIAMS AIR FORCE BASE	AF
AZ	YUMA PROVING GROUND	ARMY
CA	CAMP ROBERTS	NG
CA	CHINA LAKE NAVAL WEAPONS CENTER	NAVY
CA	EDWARDS AIR FORCE BASE	AF
CA	EL CENTRO NAVAL AIR FACILITY	NAVY
CA	FORT IRWIN	ARMY
CA	GEORGE AIR FORCE BASE	AF
CA	LEMOORE NAVAL AIR STATION	NAVY
CA	MARCH AIR FORCE BASE	AF
CA	MC LOGISTICS BASE, BARSTOW	USMC
CA	MCAGCC TWENTYNINE PALMS	USMC
CA	SANTA ANA ARMY DEPOT	ARMY
CA	WEAPONS TEST CENTER, MINDEN PORT	USMC
CA	WHITE SANDS MISSILE RANGE	NG
NM	CANNON AIR FORCE BASE	AF
NM	FORT WINGATE DEPOT ACTIVITY	ARMY
NM	HOLLOWAY AIR FORCE BASE	AF
NM	KIRTLAND AIR FORCE BASE	AF
NM	WHITE SANDS MISSILE RANGE	ARMY
NV	FALLOON NAVAL AIR STATION	NAVY
NV	HAWTHORNE ARMY AMMUNITION PLANT	ARMY
NV	INDIAN SPRINGS AF AUX FIELD	AF
NV	HELLIS AIR FORCE BASE	AF
TX	FORT BLISS	ARMY
TX	REESE AIR FORCE BASE	AF
UT	CAMP WILLIAMS	NG
UT	DUGWAY PROVING GROUND	ARMY
UT	HILL AIR FORCE RANGE	AF
UT	TOOELE ARMY DEPOT NORTH	ARMY
UT	TOOELE ARMY DEPOT SOUTH	ARMY
WY	F.E. WARREN AIR FORCE BASE	AF

BASES ELIMINATED

4.3 RESULTS

The 35 potential Main Operating Bases remaining after application of Exclusionary Criteria are shown in Figure 4-9 and Table 4-7. The table also shows total suitable area within 50 radial miles of each Main Operating Base.

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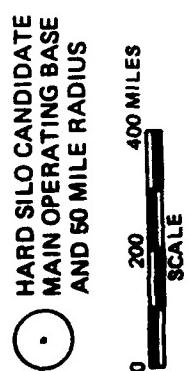
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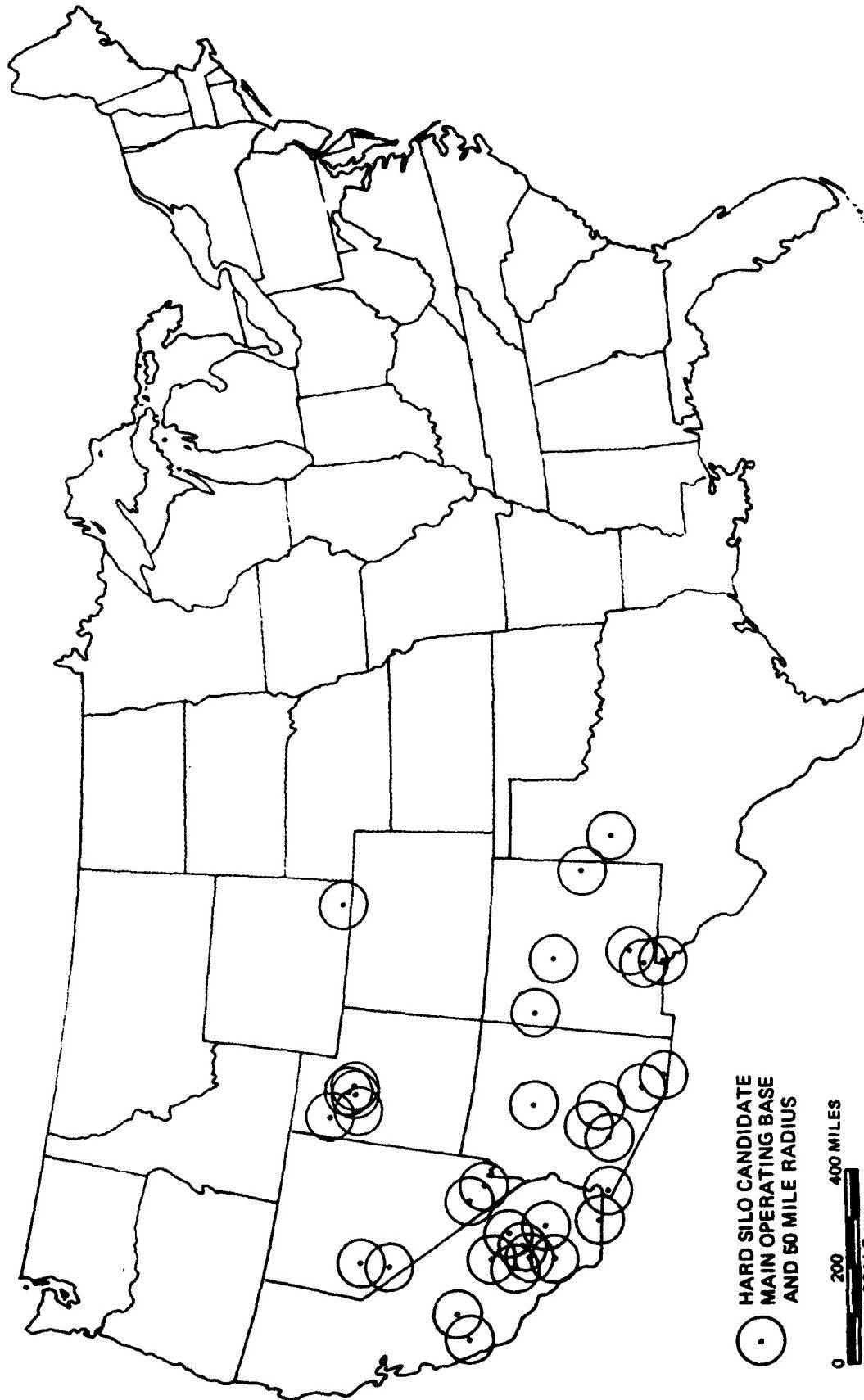
FIGURE
4-8

MAIN OPERATING BASES REMAINING WITH POTENTIAL FOR HARD SILO IN PATTERNED ARRAY
FOLLOWING APPLICATION OF EXCLUSIONARY CRITERIA

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HARD SILO CANDIDATE
MAIN OPERATING BASE
AND 50 MILE RADIUS



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TABLE 4-7: MAIN OPERATING BASES REMAINING AFTER APPLICATION OF EXCLUSIONARY CRITERIA WITH POTENTIAL FOR HARD SILO IN PATTERNED ARRAY

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>TOTAL SUITABLE AREA (SQ MI)</u>
AZ	DAVIS-MONTHAN AIR FORCE BASE	AF	2224
AZ	FORT HUACHUCA	ARMY	1300
AZ	GILA BEND AF AUX FIELD	AF	2435
AZ	LUKE AIR FORCE BASE	AF	2171
AZ	MARINE CORPS AIR STATION, YUMA	USMC	1226
AZ	NAVAJO DEPOT ACTIVITY	ARMY	156
AZ	WILLIAMS AIR FORCE BASE	AF	2339
AZ	YUMA PROVING GROUND	ARMY	1487
CA	CAMP ROBERTS	NG	478
CA	CHINA LAKE NAVAL WEAPONS CENTER	NAVY	909
CA	EDWARDS AIR FORCE BASE	AF	1343
CA	EL CENTRO NAVAL AIR FACILITY	NAVY	546
CA	FORT IRWIN	ARMY	1039
CA	GEORGE AIR FORCE BASE	AF	894
CA	LEMOORE NAVAL AIR STATION	NAVY	871
CA	MARCH AIR FORCE BASE	AF	387
CA	MC LOGISTIC BASE, BARSTOW	USMC	1146
CA	MCAGCC TWENTYNINE PALMS	USMC	1158
CA	CANNON AIR FORCE BASE	AF	1869
NM	FORT WINGATE DEPOT ACTIVITY	ARMY	174
NM	HOLLOMAN AIR FORCE BASE	AF	975
NM	KIRTLAND AIR FORCE BASE	AF	707
NM	WHITE SANDS MISSILE RANGE	ARMY	2113
NV	FALON NAVAL AIR STATION	NAVY	386
NV	HAWTHORNE ARMY AMMUNITION PLANT	ARMY	488
NV	INDIAN SPRINGS AF AUX FIELD	AF	821
NV	NELLIS AIR FORCE BASE	AF	918
TX	FORT BLISS	ARMY	1894
TX	REESE AIR FORCE BASE	AF	663
UT	CAMP WILLIAMS	NG	495
UT	DUGWAY PROVING GROUND	ARMY	801
UT	HILL AIR FORCE RANGE	AF	238
UT	TOOELE ARMY DEPOT NORTH	ARMY	537
UT	TOOELE ARMY DEPOT SOUTH	ARMY	679
WY	F.E. WARREN AIR FORCE BASE	AF	200

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5.0 APPLICATION OF EVALUATIVE CRITERIA

Evaluative Criteria are those criteria that do not eliminate an alternative when applied individually but, in combination, may indicate performance that is better or worse than that of other areas. Each potential Main Operating Base and its potential Deployment Area was evaluated using the Evaluative Criteria to determine the attainment of key system goals and subgoals. Potential Main Operating Bases were evaluated with regard to their ability to support potential deployment areas within 50 miles of the Main Operating Base. The degree to which the potential Main Operating Bases and their potential Deployment Areas achieve these system goals was measured through the Evaluative Criteria.

5.1 EVALUATIVE CRITERIA

Five system goals were defined: 1) maximize system effectiveness; 2) optimize system operability; 3) optimize system practicability; 4) minimize public impact; and 5) minimize environmental impacts. All five system goals are considered to be important in discriminating among geographical alternatives and are the basis for Hard Silo in Patterned Array complex evaluations. The hierarchy of goals, subgoals, objectives, and criteria is depicted in Table 5-1. Specific definitions and rationale for each criterion are supplied in Appendix C.

System effectiveness is the capability to project a credible deterrent. System effectiveness, in the final analysis, is the reason the system is being developed. System operability is the capability to efficiently accomplish operations and maintenance of the weapon system for its operational life. System operability fundamentally supports the system effectiveness by measuring the characteristics, capacity, and ability of candidate Main Operating Base facilities and infrastructure to support a new mission.

System practicability is a measure of the ability to afford the system in terms of cost and technical risk. System practicability for this evaluation is a measure of construction characteristics in the Deployment Area. Public impact is a measure of the relative impacts on the public of various system alternatives; the proposal(s) causing the least impact is considered the best. Public impact may constrain operability considerations and increase costs. It generally considers people, land use, safety, and security issues. Environmental impact is a measure of the relative impacts on the environment of various system alternatives; the proposal(s) causing the least impact is considered the best. Environmental impacts considered are some of the natural and physical characteristics of an area that could change, be altered, or influenced during Small ICBM system deployment and/or operation.

TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

Page 1 of 11

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
1 MAXIMIZE SYSTEM EFFECTIVENESS	1.2 OPTIMIZE COMMAND, CONTROL AND COMMUNICATION CAPABILITY	1.2.2 MAXIMIZE SECURITY	1.2.2.B.1 PREFER MAIN OPERATING BASES WITH MINIMUM PUBLIC INTERFACE IN THE DEPLOYMENT AREAS	DENSITY AND DISTRIBUTION OF INHABITED STRUCTURES
			1.2.2.B.2 PREFER MAIN OPERATING BASES WITH FEWER TRANSPORTATION/UTILITY CORRIDORS IN THE DEPLOYMENT AREAS	PERCENT OF PARCEL AREA LOSS DUE TO MAJOR TRANSPORTATION/UTILITY CORRIDORS
	1.4 OPTIMIZE SYSTEM ADAPTABILITY/FLEXIBILITY	1.4.2 CONSIDER SYSTEM EXPANDABILITY	1.4.2.B.1 PREFER MAIN OPERATING BASES WITH LARGER DEPLOYMENT AREAS	SIZE OF SUITABLE PARCEL AREAS (SQUARE MILES)
2 OPTIMIZE SYSTEM OPERABILITY	2.1 OPTIMIZE DEPLOYMENT AREA OPERATIONS	2.1.1 MAXIMIZE ACCESSIBILITY TO MAINTENANCE FACILITIES	2.1.1.B.1 PREFER MAIN OPERATING BASES WITH DEPLOYMENT AREAS THAT HAVE ACCESSIBILITY TO MAINTENANCE FACILITIES	AVERAGE ROAD MILES FROM DEPLOYMENT AREAS TO MAIN OPERATING BASES
		2.1.3 MAXIMIZE OPERATION EFFECTIVENESS	2.1.3.B.1 PREFER MAIN OPERATING BASES THAT ARE EASILY ACCESSIBLE FROM THE SUPPORT COMMUNITY	ROAD MILES FROM MAIN OPERATING BASE TO SUPPORT COMMUNITY

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

Page 2 of 11

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
2. OPTIMIZE SYSTEM OPERABILITY (cont'd)	2.3.1 MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.1.1 CONSIDER FUNCTIONAL SUPPORT CAPABILITY	2.3.1.B.5 PREFER MAIN OPERATING BASES WITH INCREASE IN SUPPORT CAPABILITY DUE TO MISSION CHANGES	NUMBER, MAGNITUDE, AND STATUS OF MISSION CHANGE
		2.3.2 CONSIDER LAND AVAILABILITY	2.3.2.B.2 PREFER MAIN OPERATING BASES WITH ADEQUATE LAND TO ACCOMMODATE THE HARD SILO MISSION	QUANTITY OF AVAILABLE LAND ON-BASE (ACRES)
		2.3.3 CONSIDER INFRA-STRUCTURE SUPPORT CAPABILITY	2.3.2.B.3 PREFER MAIN OPERATING BASES WITH DOD FEE LAND OWNERSHIP OF AVAILABLE LAND	PERCENT ON-BASE OWNERSHIP OF LAND AVAILABLE FOR THE HARD SILO MISSION
			2.3.3.B.1 PREFER MAIN OPERATING BASES WHERE WATER CAN BE EASILY OBTAINED	QUANTITY AND USE (ACRE-FEET/YEAR), QUALITY AND REGULATORY PROCESS AFFECTING WATER RESOURCES
			2.3.3.B.2 PREFER MAIN OPERATING BASES WHERE POWER TO MEET PROJECT REQUIREMENTS CAN EASILY BE OBTAINED	CAPACITY, SOURCE, AND EXPANDABILITY OF POWER SYSTEM

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
<u>2</u> OPTIMIZE SYSTEM OPERABILITY (cont'd)	<u>2.3</u> MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS (cont'd)	<u>2.3.3</u> <u>CONSIDER INFRA-</u> <u>STRUCTURE SUPPORT</u> <u>CAPABILITY</u> (cont'd)	<u>2.3.3.B.3</u> <u>PREFER MAIN OPERATING</u> <u>BASES WHERE ENERGY</u> <u>(HEATING) TO MEET PROJECT</u> <u>REQUIREMENTS CAN EASILY</u> <u>BE OBTAINED</u>	CAPACITY, SOURCE, AND EXPANDABILITY OF HEATING SYSTEM
		<u>2.3.3.B.4</u> <u>PREFER MAIN OPERATING</u> <u>BASES WHERE SEWAGE</u> <u>TREATMENT CAPACITY IS</u> <u>MORE THAN ADEQUATE</u>	<u>2.3.3.B.4</u> <u>PREFER MAIN OPERATING</u> <u>BASES WHERE SEWAGE</u> <u>TREATMENT CAPACITY IS</u> <u>MORE THAN ADEQUATE</u>	CAPACITY AND EXPANDABILITY OF SEWAGE TREATMENT SYSTEM
		<u>2.3.3.B.5</u> <u>PREFER MAIN OPERATING</u> <u>BASES WHERE SOLID WASTE</u> <u>DISPOSAL SYSTEM IS MORE</u> <u>THAN ADEQUATE</u>	<u>2.3.3.B.5</u> <u>PREFER MAIN OPERATING</u> <u>BASES WHERE SOLID WASTE</u> <u>DISPOSAL SYSTEM IS MORE</u> <u>THAN ADEQUATE</u>	CAPACITY, EXPANDABILITY, AND PROJECTED LIFE OF SOLID WASTE DISPOSAL SYSTEM
		<u>2.3.3.B.6</u> <u>PREFER MAIN OPERATING</u> <u>BASES WHERE STORM</u> <u>DRAINAGE SYSTEM IS MORE</u> <u>THAN ADEQUATE</u>	<u>2.3.3.B.6</u> <u>PREFER MAIN OPERATING</u> <u>BASES WHERE STORM</u> <u>DRAINAGE SYSTEM IS MORE</u> <u>THAN ADEQUATE</u>	CAPACITY OF STORM DRAINAGE SYSTEM
		<u>2.3.4</u> <u>CONSIDER</u> <u>TRANSPORTATION</u> <u>AVAILABILITY</u>	<u>2.3.4.B.1</u> <u>PREFER MAIN OPERATING</u> <u>BASES WITH CAPABLE</u> <u>AIRFIELD ACCESSIBILITY</u>	RUNWAY LENGTH, INSTRUMENTATION, AND PROXIMITY

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
2 OPTIMIZE SYSTEM OPERABILITY (cont'd)	2.3 MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS (cont'd)	2.3.4 CONSIDER TRANSPORTATION AVAILABILITY	2.3.4.B.2 PREFER <u>MAIN OPERATING BASES WITH ADEQUATE HIGHWAY ACCESS</u>	ROAD TYPE AND DISTANCE TO MAJOR HIGHWAY, CONGESTION CONSIDERATIONS
			2.3.4.B.3 <u>PREFER <u>MAIN OPERATING BASES WITH RAILROAD FREIGHT SERVICE</u></u>	DISTANCE OF RAIL SERVICE FROM MAIN OPERATING BASE AND POTENTIAL RIGHT-OF-WAY CONFLICTS
			2.4.2 <u>MAXIMIZE MISSION COMPATIBILITY</u>	2.4.2.B.1 <u>PREFERENCE IS GIVEN TO TYPE OF BASE IN THE FOLLOWING ORDER: ICBM, SAC, AF, OTHER DOD/DOE</u>
			2.4.2.B.2 <u>PREFER <u>MAIN OPERATING BASES WITH ON-INSTALLATION DEPLOYMENT AREAS</u></u>	ON-INSTALLATION SUITABLE PARCEL SIZE (SQUARE MILES)
			2.5.1 <u>PROVIDE ADEQUATE SUPPORT SERVICES</u>	2.5.1.B.2 <u>PREFER <u>MAIN OPERATING BASES WITH AVAILABLE HOUSING</u></u>
			2.5.1.B.1 <u>PREFER <u>A LARGER DEVELOPED AREA WITHIN 25 MILES OF THE MAIN OPERATING BASE</u></u>	NUMBER AND TYPE OF AVAILABLE HOUSES ON- AND OFF-BASE
				LARGEST NEARBY POPULATION CENTER

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
³ OPTIMIZE SYSTEM PRACTICABILITY	3.2 OPTIMIZE CONSTRUCTIBILITY	3.2.1 MINIMIZE DEPLOYMENT AREA CONSTRUCTION COSTS	3.2.1.B.1 PREFER MAIN OPERATING BASES WITH DEPLOYMENT AREAS IN CLOSE PROXIMITY TO HIGH QUALITY AGGREGATES	AMOUNT, QUALITY, AND DISTRIBUTION OF AGGREGATES
			3.2.1.B.2 PREFER MAIN OPERATING BASES WITH FEWER AREAS OF ADVERSE TERRAIN IN THE DEPLOYMENT AREA	PERCENT OF PARCEL AREA WITH ADVERSE TERRAIN
			3.2.1.B.3 PREFER MAIN OPERATING BASES WHERE SUFFICIENT WATER CAN BE APPROPRIATED OR PURCHASED/TRANSFERRED IN THE DEPLOYMENT AREAS	QUANTITY AND USE (ACRE-FEET/YEAR), QUALITY, AND REGULATORY PROCESS AFFECTING WATER RESOURCES
⁴ MINIMIZE PUBLIC IMPACT	4.1 MINIMIZE ECONOMIC IMPACTS	4.1.1 AVOID HIGH VALUE LAND	4.1.1.B.1 PREFER MAIN OPERATING BASES WITH FEWER AREAS OF ENERGY AND/OR MINERAL RESOURCE INTEREST IN THE DEPLOYMENT AREAS	PERCENT OF TOWNSHIPS WITH ENERGY/MINERAL LEASE/MINING CLAIM COVERAGE

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
4 MINIMIZE PUBLIC IMPACT (cont'd)	4.1 MINIMIZE ECONOMIC IMPACTS (cont'd)	4.1.1 <u>AVOID</u> HIGH VALUE LAND (cont'd)	4.1.1.B.2 <u>PREFER</u> MAIN OPERATING BASES WITH FEWER PRIME AND UNIQUE FARMLANDS IN THE DEPLOYMENT AREAS	PERCENT OF PARCEL AREA WITH PRIME AND UNIQUE FARMLAND
		4.1.1.B.3 <u>PREFER</u> MAIN OPERATING BASES WITH FEWER HIGH YIELD TIMBERLANDS IN THE DEPLOYMENT AREAS	4.1.1.B.3 <u>PREFER</u> MAIN OPERATING BASES WITH FEWER HIGH YIELD TIMBERLANDS IN THE DEPLOYMENT AREAS	PERCENT OF PARCEL AREA WITH TIMBERLAND
		4.1.1.B.4 <u>PREFER</u> MAIN OPERATING BASES WITH FEWER AREAS OF PLANNED LAND USE IN THE DEPLOYMENT AREAS	4.1.1.B.4 <u>PREFER</u> MAIN OPERATING BASES WITH FEWER AREAS OF PLANNED LAND USE IN THE DEPLOYMENT AREAS	PERCENT OF PARCEL AREA WITHIN EXISTING LAND USE PLANS
		4.1.1.B.5 <u>PREFER</u> MAIN OPERATING BASES WITH LESS IMPACT ON AGRICULTURAL PRODUCTIVITY IN THE DEPLOYMENT AREAS	4.1.1.B.5 <u>PREFER</u> MAIN OPERATING BASES WITH LESS IMPACT ON AGRICULTURAL PRODUCTIVITY IN THE DEPLOYMENT AREAS	PERCENT OF PARCEL AREA WITH AGRICULTURAL DEVELOPMENT
		4.1.2 <u>AVOID</u> HIGH-VALUE ECONOMIC RESOURCES	4.1.2.B.1 <u>PREFER</u> MAIN OPERATING BASES WITH FEWER KNOWN ENERGY RESOURCE AREAS IN THE DEPLOYMENT AREAS	PERCENT OF TOWNSHIPS WITH KNOWN ENERGY RESOURCE AREAS

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>	
4 MINIMIZE PUBLIC IMPACT (cont'd)	4.1 MINIMIZE ECONOMIC IMPACTS (cont'd)	4.1.2 AVOID HIGH VALUE ECONOMIC RESOURCES (cont'd)	4.1.2.B.2 <u>PREFER MAIN</u> OPERATING BASES WITH FEWER HIGH VALUE MINERAL RESOURCE AREAS IN THE DEPLOYMENT AREAS	PERCENT OF TOWNSHIPS WITH HIGH VALUE MINERAL RESOURCE AREAS	
		4.1.3 MINIMIZE LAND ACQUISITION	4.1.3.B.1 <u>PREFER MAIN</u> OPERATING BASES WITH DOD FEE LAND FOR THE DEPLOYMENT AREA	PERCENT OF PARCEL WITH DOD FEE/DOD WITHDRAWN-GENERAL VERSUS PERCENT PRIVATE LAND	
			4.1.3.B.2 <u>PREFER MAIN</u> OPERATING BASES WITH ON-INSTALLATION DEPLOYMENT AREA	AVERAGE ON- INSTALLATION SUITABLE PARCEL SIZE (SQUARE MILES)	
			4.1.3.B.3 <u>PREFER MAIN</u> OPERATING BASES CONTIGUOUS WITH EXISTING DOD/DOE INSTALLATIONS	AMOUNT OF SUITABLE AREA ON CONTIGUOUS DOD/ DOE INSTALLATIONS	
			4.1.4 MINIMIZE INFRASTRUCTURE IMPACT	4.1.4.B.1 <u>PREFER MAIN</u> OPERATING BASES WITH FEWER TRANSPORTATION/UTILITY CORRIDORS IN THE DEPLOYMENT AREAS	PERCENT OF PARCEL AREA LOSS DUE TO MAJOR TRANSPORTATION/ UTILITY CORRIDORS

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
4 MINIMIZE PUBLIC IMPACT (cont'd)	4.1 MINIMIZE ECONOMIC IMPACTS (cont'd)	4.1.5 MINIMIZE IMPACTS ON RESOURCE AVAILABILITY	4.1.5.B.1 PREFER AREAS WHERE SUFFICIENT WATER CAN BE APPROPRIATED OR PURCHASED/ TRANSFERRED FOR THE MAIN OPERATING BASE AND SUPPORT COMMUNITY	QUANTITY AND USE (ACRE-FEET/YEAR), QUALITY, AND REGULATORY PROCESS AFFECTING WATER RESOURCES
			4.2.2 AVOID NATURAL HAZARDS	4.2.2.B.1 PREFER MAIN OPERATING BASES WITH LESS LAND WITHIN 100-YEAR FLOODPLAINS IN THE DEPLOYMENT AREAS
	4.2 MAXIMIZE PUBLIC SAFETY/SECURITY		4.2.3 AVOID SAFETY CONFLICTS	4.2.3.B.1 PREFER MAIN OPERATING BASES WITH MINIMUM PUBLIC INTERFACE IN THE DEPLOYMENT AREAS
			4.3.1 MINIMIZE SOCIAL DISRUPTION	4.3.1.B.1 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACTS CONTAIN LARGE POPULATIONS
	4.3 MINIMIZE SOCIAL IMPACTS			CITY POPULATIONS IN ALL COUNTIES EITHER WHOLLY OR PARTIALLY WITHIN 50 MILES OF THE MAIN OPERATING BASE

TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>	
4 (cont'd) MINIMIZE PUBLIC IMPACT	4.3 (cont'd) MINIMIZE SOCIAL IMPACTS	4.3.1 (cont'd) MINIMIZE SOCIAL DISRUPTION	4.3.1.B.2 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT HAVE AVAILABLE LABOR	NONAGRICULTURAL EMPLOYMENT FIGURES	
			4.3.1.B.3 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT HAVE A DIVERSE ECONOMIC BASE	NUMBER OF FIRM TYPES PRODUCING FOR EXPORT CONSUMPTION	
			4.3.1.B.4 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT AFFECT POPULATION CENTERS WITH SUBGROUP POPULATIONS SIMILAR TO THOSE INDUCED BY PROJECT CONSTRUCTION/ OPERATION	SUM OF MILITARY AND CONSTRUCTION EMPLOYMENT VERSUS TOTAL EMPLOYMENT	
			4.3.2 MINIMIZE ADVERSE IMPACTS ON PUBLIC FINANCE	4.3.2.B.3 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT EXHIBIT AN ADEQUATE TAXING EFFORT	TOTAL OWN-SOURCE REVENUES VERSUS PERSONAL INCOME

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
4 MINIMIZE PUBLIC IMPACT (cont'd)	4.3 MINIMIZE SOCIAL IMPACTS (cont'd)	4.3.3 MINIMIZE IMPACTS ON COMMUNITY SUPPORT CAPABILITY	4.3.3.B.1 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT HAVE LARGE HOUSING SUPPLIES	TOTAL OPP- INSTALLATION VACANT HOUSING UNITS
5 MINIMIZE ENVIRONMENTAL IMPACTS	5.1 MINIMIZE IMPACTS TO NATURAL ENVIRONMENT	5.1.2 MINIMIZE POLLUTION EFFECTS	5.1.2.B.1 PREFER MAIN OPERATING BASES/DEPLOYMENT AREAS WHERE AIR QUALITY IS NOT COMPROMISED	AMOUNT OF COMMON AIR POLLUTANTS AND PREVENTION OF SIGNIFICANT DETERIORATION IN CLASS I AREAS
			5.2.1 MINIMIZE IMPACTS TO HISTORIC RESOURCES	5.2.1.B.1 PREFER MAIN OPERATING BASES/DEPLOYMENT AREAS WITH FEWER SIGNIFICANT CULTURAL RESOURCES
			5.3 MINIMIZE IMPACTS ON SPECIAL STATUS LANDS	5.3.2.B.1 PREFER MAIN OPERATING BASES WHICH MINIMIZE IMPACTS TO WILDERNESS STUDY AREAS/RARE II

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TABLE 5-1 HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
5 MINIMIZE ENVIRONMENTAL IMPACTS (cont'd)	5.3 MINIMIZE IMPACTS ON SPECIAL STATUS LANDS (cont'd)	5.3.2 MINIMIZE DISTURBANCE TO SPECIAL USE AREAS (cont'd)	5.3.2.B.2 PREFER MAIN OPERATING BASES WHICH MINIMIZE IMPACTS TO EXPERIMENTAL RANGES/F FARMS	PERCENT OF PARCEL AREA WITHIN EXPERIMENTAL RANGE/F FARMS

5.3.2.B.3 PREFER MAIN OPERATING BASES WHICH MINIMIZE IMPACTS TO NATIONAL AND STATE FORESTS	PERCENT OF PARCEL AREA WITHIN NATIONAL AND STATE FORESTS
---	--

5.1.1 Maximize System Effectiveness

The first goal, maximizing system effectiveness, was evaluated by considering two objectives: maximize system security and optimize system adaptability and flexibility. System security was measured by density and distribution of inhabited structures in the Deployment Areas. Areas with no or few inhabited structures are preferred because Deployment Areas with fewer people will generally enhance area security and limit public interface. Siting a system at a base that has a large amount of suitable area is preferred because it provides more opportunities for finding the optimum location for systems effectiveness.

5.1.2 Optimize System Operability

System operability considers the characteristics and capability of candidate Main Operating Bases to accommodate the Small ICBM mission. Deployment Area operations were examined by evaluating the proximity (in road miles) of the Deployment Area to maintenance facilities and the proximity of the Main Operating Base to support communities. For maintenance facilities, preference was given to those suitable parcels closest to the candidate Main Operating Base. Operations effectiveness is improved when travel time from the Main Operating Base to the Deployment Area is reduced. Preference was given to the Main Operating Bases closest to large support communities because quality of support services to base personnel is enhanced when local

communities can provide a wide range of human services.

Additional preference was given to those Main Operating Bases/Deployment Areas that have favorable ownership conditions.

The effectiveness of a Main Operating Base was evaluated by its functional support capability, land availability, infrastructure support capability, and availability of existing transportation systems. Preference was given to those Main Operating Bases where it could be determined that suitable infrastructure exists, has surplus capacity, or is easily expandable. Preference was also given to Main Operating Bases that have surplus or otherwise available land for locating Initial Operational Capability facilities and other components of the Hard Silo system.

Evaluation of mission compatibility of the Main Operating Base was based on the existing support service infrastructure. Preference was given to Main Operating Bases with existing Air Force Strategic Air Command ICBM missions.

5.1.3 Optimize System Practicability

The third system goal, optimize system practicability, was evaluated for optimizing preliminary key constructibility parameters. These parameters include availability of aggregate and water resources for construction, and estimates of adverse terrain (i.e., rolling terrain, hills).

Preference was given to suitable areas that had adequate high-quality aggregate resources and where a sufficient quantity of good quality water could be obtained.

Preference was also given to suitable areas with fewer incidences of adverse terrain.

5.1.4 Minimize Public Impact

The fourth system goal, minimize public impact, was evaluated for minimizing economic impacts and social disruption and maximizing public safety/security. Current land use was a key factor in measuring the potential degree of economic impacts. Preference was given to those suitable area parcels where competition with existing land use could be minimized, where high value land could be avoided, and where parcels were not dissected by existing roads, pipelines, and transmission lines. Preference was also given to Main Operating Bases where the surrounding suitable areas have ownership patterns that would minimize the cost and time of land acquisition. In addition, preference was given to Main Operating Bases that would accommodate the Small ICBM mission on a contiguous Department of Defense/Department of Energy installation.

Public safety/security was considered by evaluating 100-year floodplains in suitable area parcels and the relative density of inhabited structures. Preference was given to those parcels where these features could be minimized.

Social impacts were considered by evaluating the characteristics and diversity of nearby population centers. Those factors considered include community size and proximity; size, diversity, and composition of the labor pool; and diversity of a community's economy and tax base. Preference was given to Main Operating Bases where nearby communities are large, anticipate future growth, and have a diverse socioeconomic base that could more easily absorb population influx and attendant impacts that may arise as a result of project deployment.

5.1.5 Minimize Environmental Impacts

The fifth system goal, minimize environmental impacts, was evaluated by analyzing potential impacts to natural and cultural resources (specifically air quality and historic resources) and identifying potential impacts to special status lands. Areas where air quality can be maintained were preferred. Similarly, Deployment Areas where no known significant cultural resources exist or where adverse effects would be minimal were preferred. Wilderness Study Areas, Roadless Area Review & Evaluation (RARE) II areas, National/State Forests lands, and other special land use categories were considered in the Deployment Area evaluation. Areas that have no or minimal amounts of these land categories were preferred.

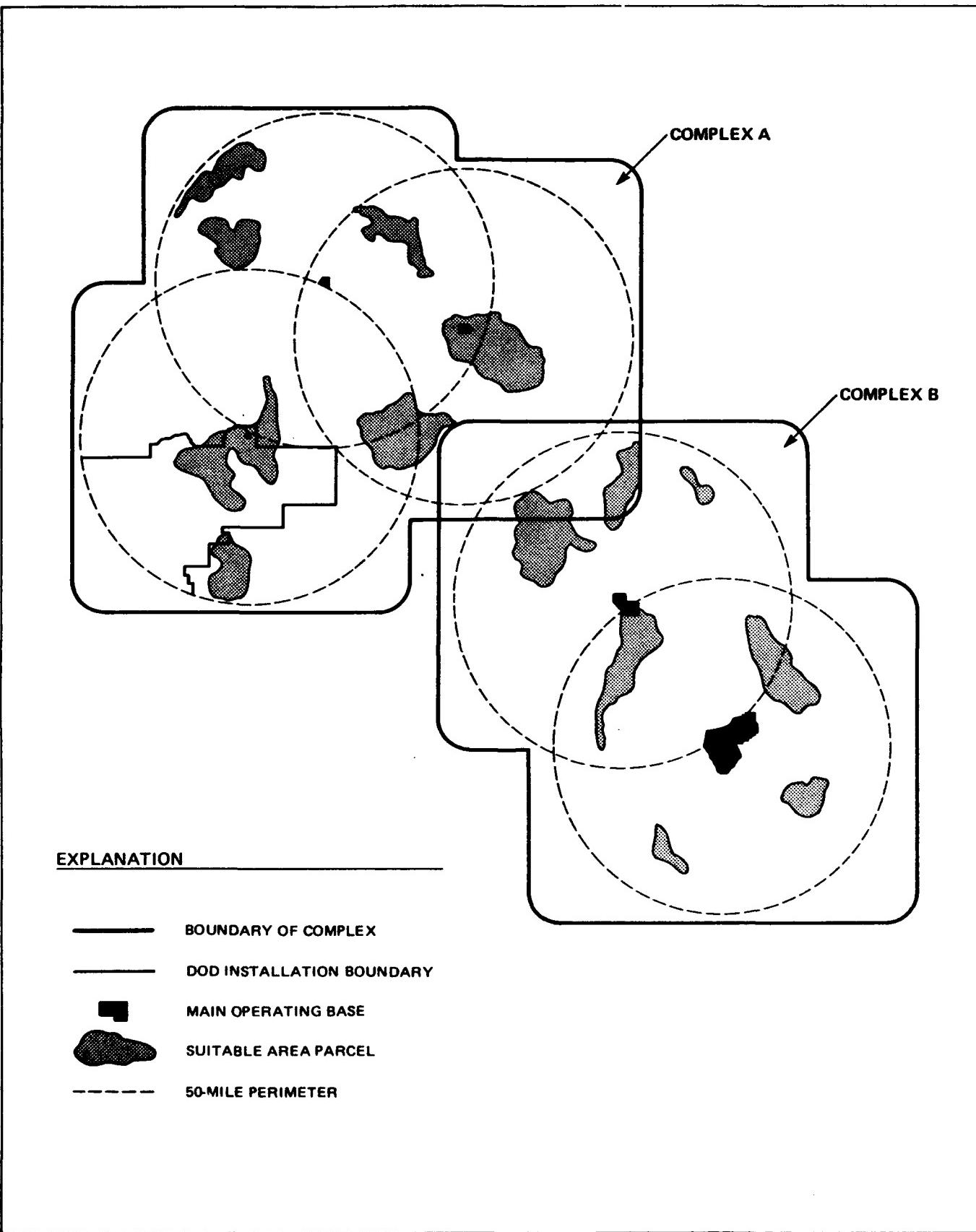
5.2 APPLICATION

Following application of Exclusionary Criteria, the remaining 35 potential Main Operating Bases and their potential Deployment Areas were grouped into complexes as shown in Figure 5-1. Complexes either share a similar potential Deployment Area or have a unique geographic relationship. The resulting 14 complexes with their potential Main Operating Bases and potential Deployment Areas (Figure 5-2, Table 5-2) were evaluated by applying the Evaluative Criteria. The results of this application were evaluated in two ways. The first identified the potential Main Operating Bases that performed less favorably within each complex. The second identified the complexes that performed less favorably.

5.3 RESULTS

The application of the Evaluative Criteria to the 35 potential Main Operating Bases within the 14 complexes, resulted in the elimination of 21 potential Main Operating Bases, with one potential Main Operating Base remaining in each of the 14 complexes, as shown in Figure 5-3 and Table 5-3.

The evaluation of the application of the Evaluative Criteria to the remaining 14 complexes resulted in the elimination of 8 complexes, with 6 complexes and their potential Main Operating Bases remaining, as shown in Figure 5-4 and Table 5-4.

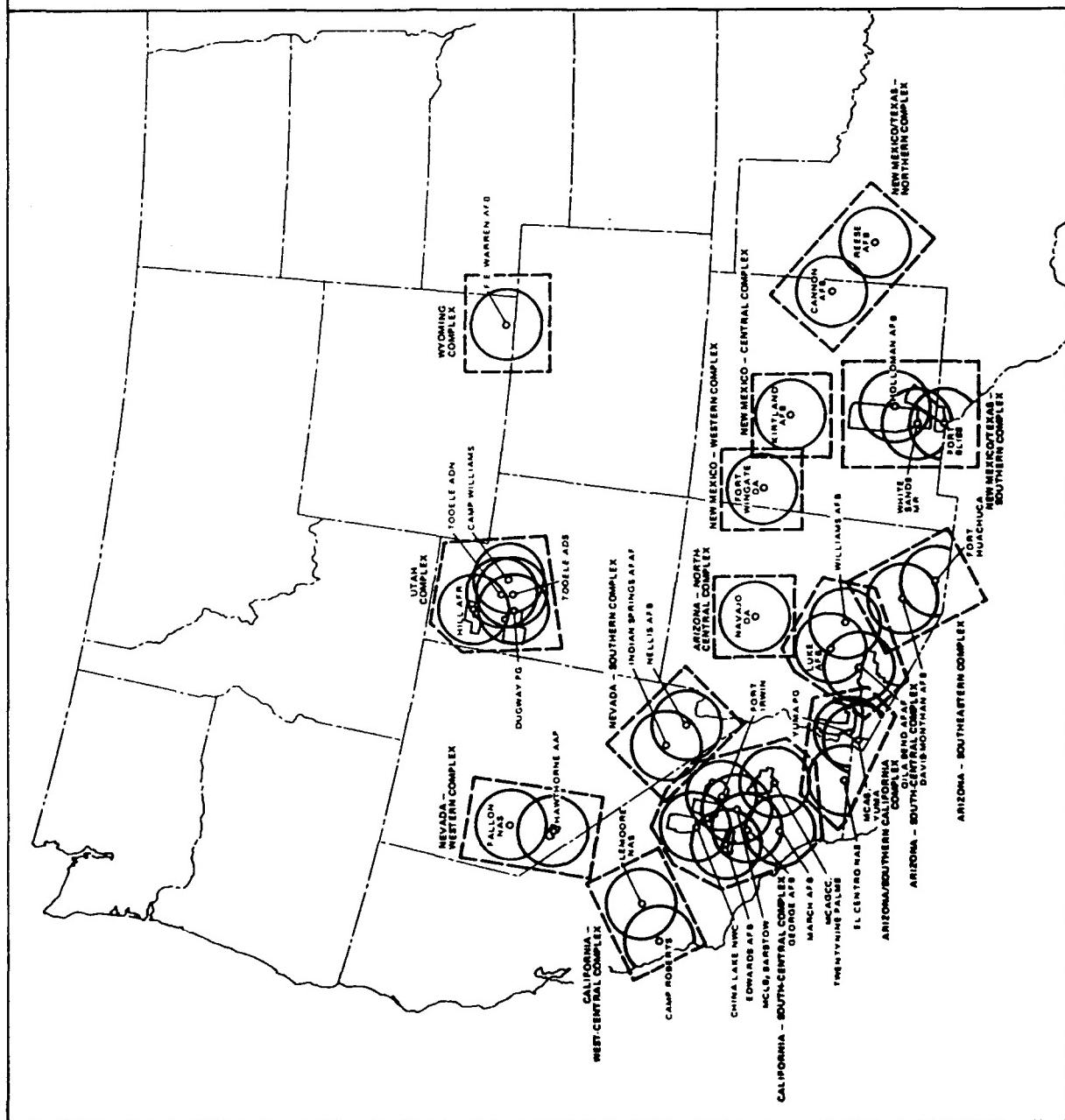
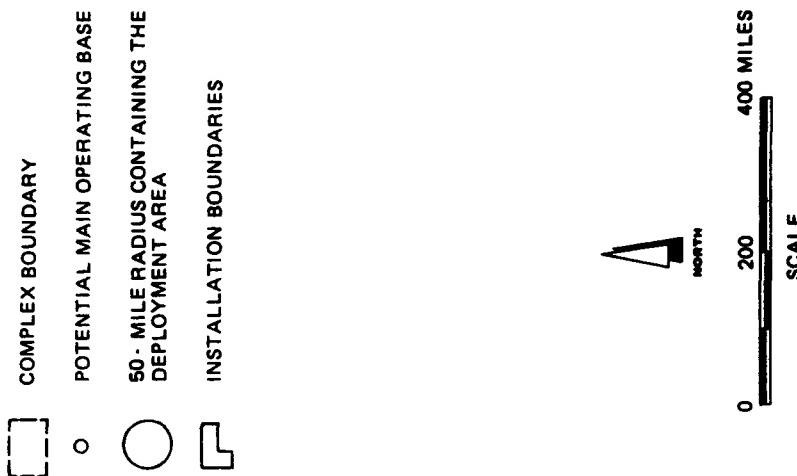


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GROUPING OF MAIN OPERATING BASES AND
ASSOCIATED DEPLOYMENT AREAS INTO A COMPLEX

FIGURE
5-1

EXPLANATION



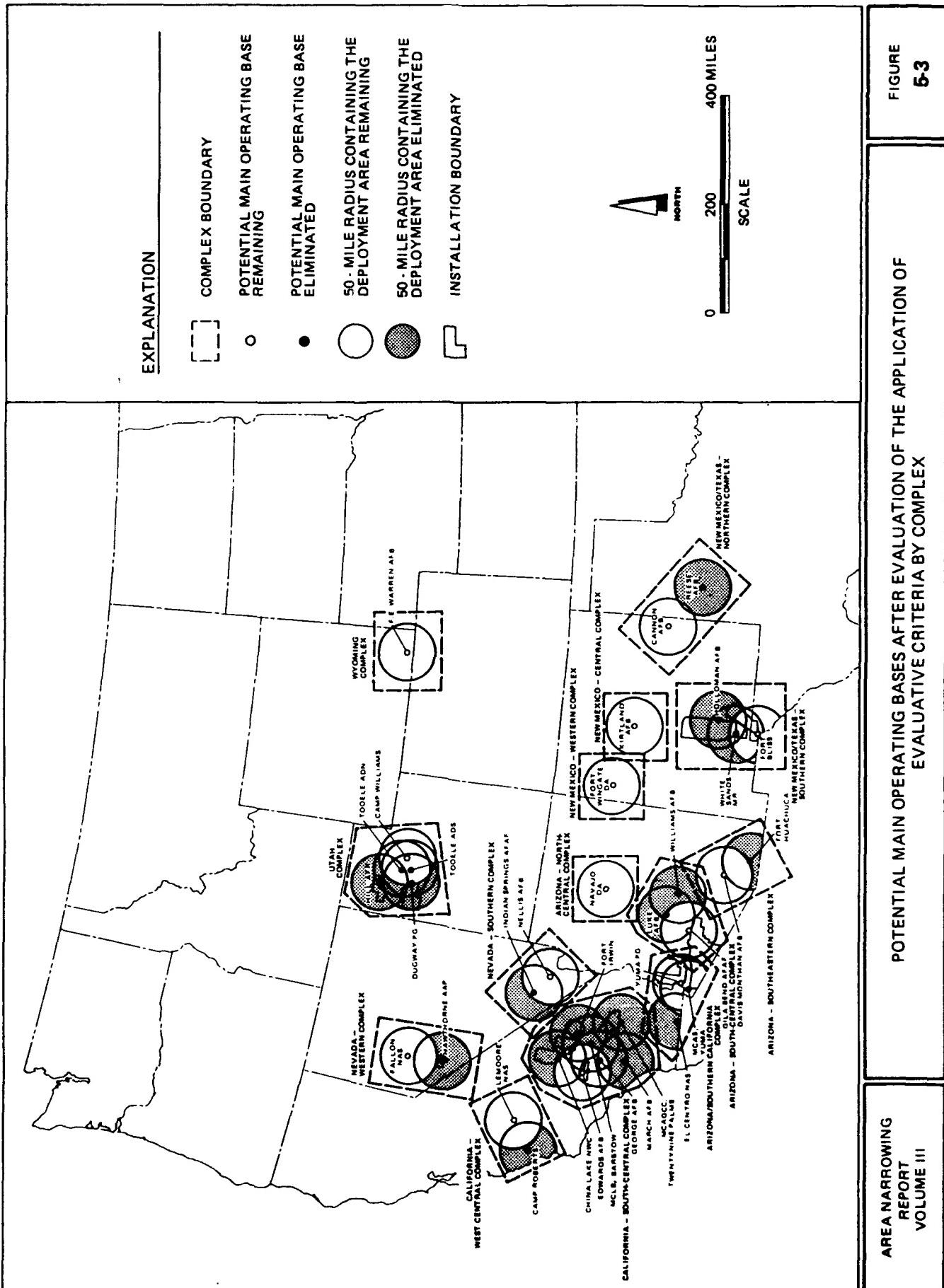
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POTENTIAL MAIN OPERATING BASES BY COMPLEX AFTER
APPLICATION OF EXCLUSIONARY CRITERIA

FIGURE
5-2

TABLE 5-2 POTENTIAL MAIN OPERATING BASES BY COMPLEX
AFTER APPLICATION OF EXCLUSIONARY CRITERIA

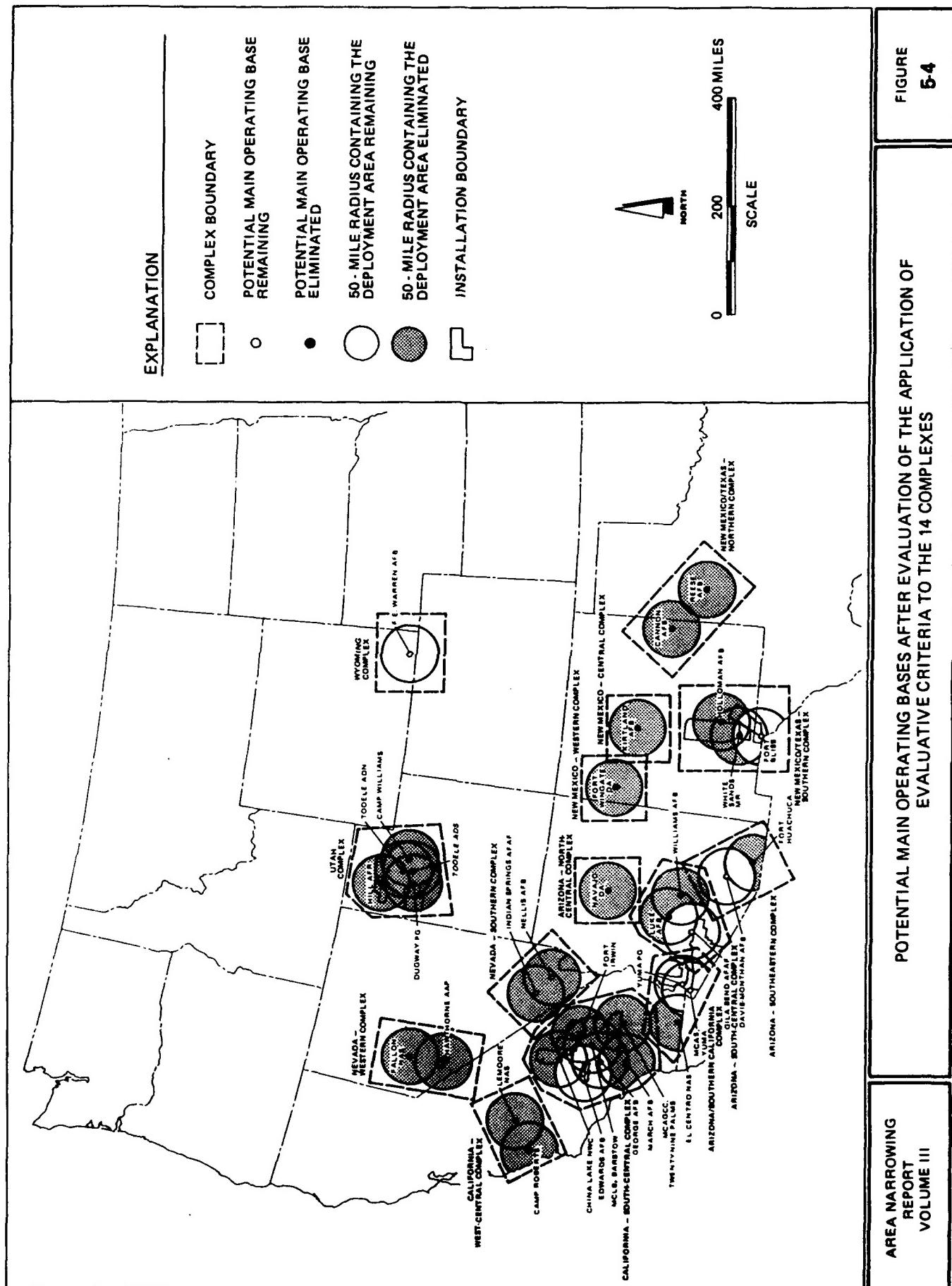
<u>ARIZONA - NORTH-CENTRAL COMPLEX</u>	• Navajo Depot Activity	<u>NEW MEXICO - CENTRAL COMPLEX</u>	• Kirtland Air Force Base
<u>ARIZONA - SOUTH-CENTRAL COMPLEX</u>	• Gila Bend Air Force Auxiliary Field	<u>NEW MEXICO - WESTERN COMPLEX</u>	• Fort Wingate Depot Activity
	• Luke Air Force Base		
	• Williams Air Force Base		
<u>ARIZONA - SOUTHEASTERN COMPLEX</u>	• Davis-Monthan Air Force Base	<u>NEW MEXICO/TEXAS - NORTHERN COMPLEX</u>	• Cannon Air Force Base
	• Fort Huachuca		• Reese Air Force Base
<u>ARIZONA/SOUTHERN CALIFORNIA COMPLEX</u>	• El Centro Naval Air Facility	<u>NEW MEXICO/TEXAS - SOUTHERN COMPLEX</u>	• Fort Bliss
	• Marine Corps Air Station, Yuma		• Holloman Air Force Base
	• Yuma Proving Ground		• White Sands Missile Range Headquarters
<u>CALIFORNIA - SOUTH-CENTRAL COMPLEX</u>	• China Lake Naval Weapons Center	<u>UTAH COMPLEX</u>	• Camp Williams
	• Edwards Air Force Base		• Dugway Proving Ground
	• Fort Irwin		• Hill Air Force Range
	• George Air Force Base		• Tooele Army Depot North
	• March Air Force Base		• Tooele Army Depot South
	• Marine Corps Air Ground Combat Center, Twentynine Palms	<u>WYOMING COMPLEX</u>	• F.E. Warren Air Force Base
	• Marine Corps Logistics Base, Barstow		
<u>CALIFORNIA - WEST-CENTRAL COMPLEX</u>	• Camp Roberts		
	• Lemoore Naval Air Station		
<u>NEVADA - SOUTHERN COMPLEX</u>	• Indian Springs Air Force Auxiliary Field		
	• Nellis Air Force Base		
<u>NEVADA - WESTERN COMPLEX</u>	• Fallon Naval Air Station		
	• Hawthorne Army Ammunition Plant		



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TABLE 5-3 POTENTIAL MAIN OPERATING BASES AFTER EVALUATION OF THE APPLICATION OF EVALUATIVE CRITERIA BY COMPLEX

<u>ELIMINATED</u>	<u>REMAINING</u>
	<u>ARIZONA - NORTH-CENTRAL COMPLEX</u> <ul style="list-style-type: none"> • Navajo Depot Activity <u>ARIZONA - SOUTH-CENTRAL COMPLEX</u> <ul style="list-style-type: none"> • Gila Bend Air Force Auxiliary Field
<u>ARIZONA - SOUTH-CENTRAL COMPLEX</u> <ul style="list-style-type: none"> • Luke Air Force Base • Williams Air Force Base <u>ARIZONA - SOUTHEASTERN COMPLEX</u> <ul style="list-style-type: none"> • Fort Huachuca 	<u>ARIZONA - SOUTHEASTERN COMPLEX</u> <ul style="list-style-type: none"> • Davis-Monthan Air Force Base <u>ARIZONA/SOUTHERN CALIFORNIA COMPLEX</u> <ul style="list-style-type: none"> • Yuma Proving Ground
<u>ARIZONA/SOUTHERN CALIFORNIA COMPLEX</u> <ul style="list-style-type: none"> • El Centro Naval Air Facility • Marine Corps Air Station, Yuma 	<u>CALIFORNIA - SOUTH-CENTRAL COMPLEX</u> <ul style="list-style-type: none"> • Edwards Air Force Base
<u>CALIFORNIA - SOUTH-CENTRAL COMPLEX</u> <ul style="list-style-type: none"> • China Lake Naval Weapons Center • Fort Irwin Air Force Bases • March Air Force Base • Marine Corps Air Ground Combat Center, • Twentynine Palms • Marine Corps Logistics Base, Barstow 	<u>CALIFORNIA - WEST-CENTRAL COMPLEX</u> <ul style="list-style-type: none"> • Lemoore Naval Air Station <u>NEVADA - SOUTHERN COMPLEX</u> <ul style="list-style-type: none"> • Nellis Air Force Base <u>NEVADA - WESTERN COMPLEX</u> <ul style="list-style-type: none"> • Fallon Naval Air Station
<u>NEVADA - SOUTHERN COMPLEX</u> <ul style="list-style-type: none"> • Indian Springs Air Force Auxiliary Field 	<u>NEW MEXICO - CENTRAL COMPLEX</u> <ul style="list-style-type: none"> • Kirtland Air Force Base
<u>NEVADA - WESTERN COMPLEX</u> <ul style="list-style-type: none"> • Hawthorne Army Ammunition Plant 	<u>NEW MEXICO - WESTERN COMPLEX</u> <ul style="list-style-type: none"> • Port Wingate Depot Activity
	<u>NEW MEXICO/TEXAS - NORTHERN COMPLEX</u> <ul style="list-style-type: none"> • Reese Air Force Base <u>NEW MEXICO/TEXAS - SOUTHERN COMPLEX</u> <ul style="list-style-type: none"> • Holloman Air Force Base • White Sands Missile Range Headquarters
	<u>UTAH COMPLEX</u> <ul style="list-style-type: none"> • Camp Williams <u>WYOMING COMPLEX</u> <ul style="list-style-type: none"> • F.E. Warren Air Force Base



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POTENTIAL MAIN OPERATING BASES AFTER EVALUATION OF THE APPLICATION OF
EVALUATIVE CRITERIA TO THE 14 COMPLEXES

FIGURE
5-4

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**TABLE 5-4 POTENTIAL MAIN OPERATING BASES AFTER EVALUATION OF THE APPLICATION
OF EVALUATIVE CRITERIA TO THE 14 COMPLEXES**

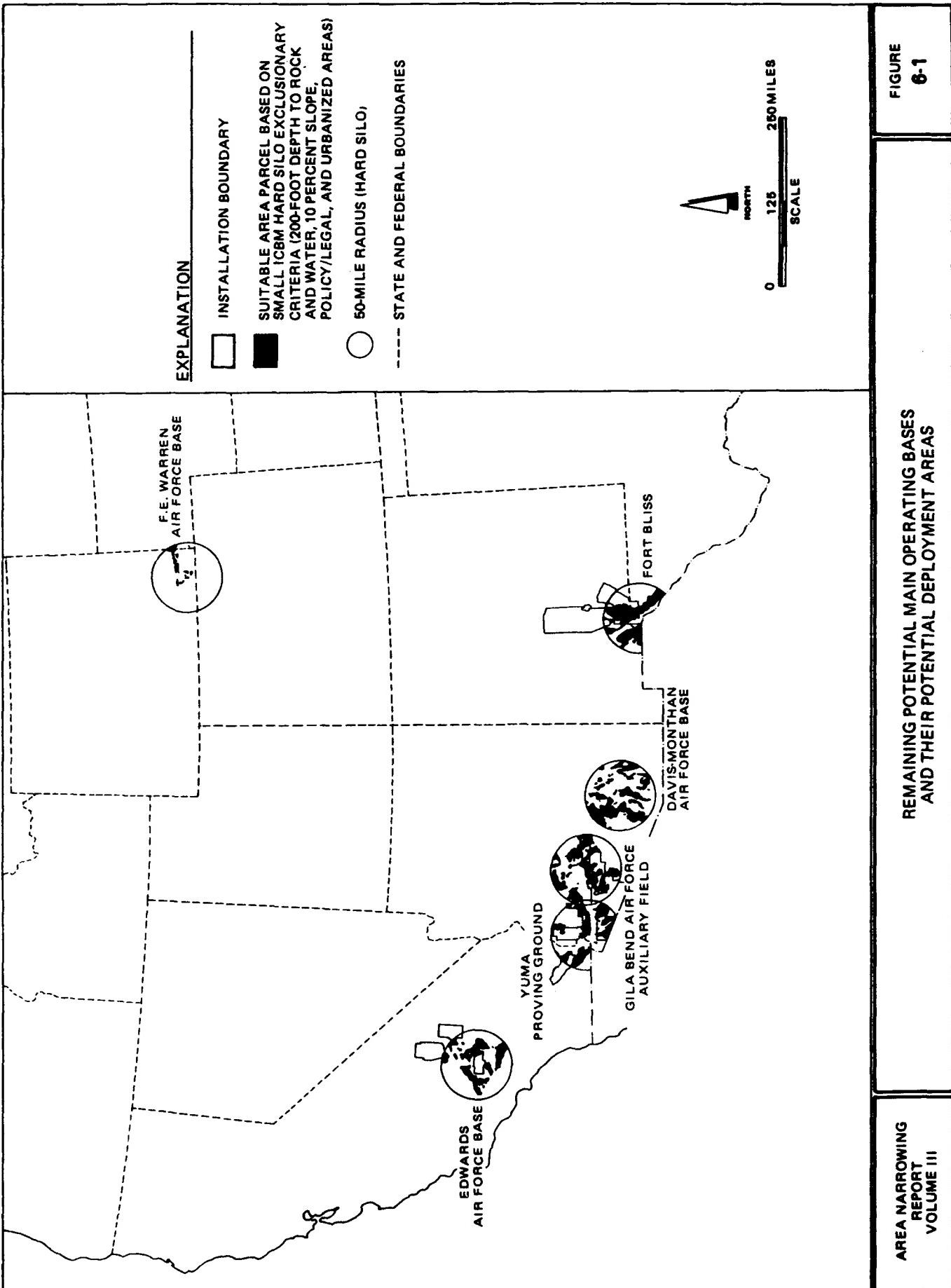
<u>ELIMINATED</u>	<u>REMAINING</u>
<u>ARIZONA - NORTH-CENTRAL COMPLEX</u>	<u>ARIZONA - SOUTH-CENTRAL COMPLEX</u>
• Navajo Depot Activity	• Gila Bend Air Force Auxiliary Field
<u>CALIFORNIA - WEST-CENTRAL COMPLEX</u>	<u>ARIZONA - SOUTHEASTERN COMPLEX</u>
• Lemoore Naval Air Station	• Davis-Monthan Air Force Base
<u>NEVADA - NORTHERN COMPLEX</u>	<u>ARIZONA/SOUTHERN CALIFORNIA COMPLEX</u>
• Nellis Air Force Base	• Yuma Proving Ground
<u>NEVADA - WESTERN COMPLEX</u>	<u>CALIFORNIA - SOUTH-CENTRAL COMPLEX</u>
• Fallon Naval Air Station	• Edwards Air Force Base
<u>NEW MEXICO - CENTRAL COMPLEX</u>	<u>NEW MEXICO/TEXAS - SOUTHERN COMPLEX</u>
• Kirtland Air Force Base	• Fort Bliss
<u>NEW MEXICO - WESTERN COMPLEX</u>	<u>WYOMING - COMPLEX</u>
• Fort Wingate Depot Activity	• F.E. Warren Air Force Base
<u>NEW MEXICO/TEXAS NORTHERN COMPLEX</u>	<u>UTAH COMPLEX</u>
• Cannon Air Force Base	• Camp Williams

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6.0 RECOMMENDATIONS

As a result of the Comprehensive Siting Analysis Process, all but six complexes have been eliminated from consideration for Hard Silo in Patterned Array deployment. The remaining complexes are recommended for further evaluation in the Environmental Impact Analysis Process. The remaining potential Main Operating Bases and their potential Deployment Areas are shown in Figure 6-1 and listed in Table 6-1.



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TABLE 6-1 Remaining Main Operating Bases

- Davis-Monthan Air Force Base, Arizona
- Edwards Air Force Base, California
- F.E. Warren Air Force Base, Wyoming
- Fort Bliss, Texas
- Gila Bend Air Force Auxiliary Field, Arizona
- Yuma Proving Ground, Arizona

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SENSITIVE

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APPENDIX A

MAJOR MILITARY INSTALLATIONS

SENSITIVE

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SENSITIVE

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
AL	ALABAMA ARMY AMMO PLANT	ARMY	5
AL	ANNISTON ARMY DEPOT	ARMY	5
AL	BARIN FIELD	NAVY	5
AL	CAIRNS AAF	ARMY	5
AL	COOSA RIVER STORAGE AREA	ARMY	5
AL	FORT MC CLELLEN	ARMY	5
AL	FORT RUCKER	ARMY	5
AL	GUNTER AIR FORCE STATION	AF	5
AL	MAXWELL AIR FORCE BASE	AF	5
AL	REDSTONE ARSENAL	ARMY	5
AL	SHEFFIELD PHOSPHATE DEVP WORKS	ARMY	4
AR	BLYTHEVILLE AIR FORCE BASE	AF	5
AR	FORT CHAFFEE	ARMY	5
AR	LITTLE ROCK AIR FORCE BASE	AF	5
AR	PINE BLUFF ARSENAL	ARMY	5
AZ	DAVIS-MON AIR FORCE BASE	AF	
AZ	FLAGSTAFF STATION NAVAL OBSERVATORY	NAVY	4
AZ	FORT HUACHUCA	ARMY	
AZ	FORT HUACHUCA, GILA BEND	ARMY	4
AZ	GILA BEND AF AUX FIELD	AF	
AZ	LUKE AIR FORCE BASE	AF	
AZ	LUKE AIR FORCE RANGE	AF	4
AZ	MARINE CORPS AIR STATION, YUMA	USMC	
AZ	NAVAJO DEPOT ACTIVITY	ARMY	
AZ	TUCSON PLANT NO. 44	AF	4
AZ	WILLIAMS AIR FORCE BASE	AF	
AZ	YUMA PROVING GROUND	ARMY	
CA	ALAMEDA NAVAL AIR STATION	NAVY	
CA	BEALE AIR FORCE BASE	AF	5
CA	BRIDGEPORT WEAPONS TEST CENTER	USMC	
CA	CAMP PENDLETON MARINE CORPS BASE	USMC	5
CA	CAMP ROBERTS	NG	

¹Reference: "Detailed listing of real property owned by the United States and used by the Department of Defense military functions throughout the world as of 30 September 1983." July 1984, United States General Services Administration, Office of Administration.

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
CA	CAMP SAN LUIS OBISPO	ARMY	5
CA	CASTLE AIR FORCE BASE	AF	5
CA	CENTERVILLE BEACH FACILITY	NAVY	4
CA	CHINA LAKE NAVAL WEAPONS CENTER	NAVY	
CA	CHOCOLATE MOUNTAIN AGR	NAVY	4
CA	CONCORD WEAPONS STATION	NAVY	5
CA	CONCORD WEAPONS STA, SOLANO	NAVY	5
CA	CORONA ANNEX WEAPONS CENTER	NAVY	4
CA	CORONADO AMPHIBIOUS BASE	NAVY	4
CA	CUDDEBACK LAKE AF RANGE	AF	4
CA	EDWARDS AIR FORCE BASE	AF	
CA	EL CENTRO NAVAL AIR FACILITY	NAVY	
CA	FORT BAKER EAST	ARMY	
CA	FORT HUNTER LIGGETT	ARMY	5
CA	FORT IRWIN NATIONAL TRAINING CENTER	ARMY	
CA	FORT MACARTHUR	ARMY	
CA	FORT ORD	ARMY	5
CA	GEORGE AIR FORCE BASE	AF	
CA	LEMOORE NAVAL AIR STATION	NAVY	
CA	LOMPOC DISCIPLINARY BARRACKS	ARMY	4
CA	LONG BEACH SHIPYARD	NAVY	4
CA	LOS ANGELES AIR FORCE STATION	AF	
CA	MARCH AIR FORCE BASE	AF	
CA	MARE ISLAND SHIPYARD	NAVY	4
CA	MARINE CORPS AIR STATION, EL TORO	USMC	5
CA	MARINE CORPS AIR STATION, TUSTIN	USMC	
CA	MARINE CORPS LOGISTICS BASE, BARSTOW	USMC	
CA	MCAGCC, TWENTYNINE PALMS	USMC	
CA	MATHER AIR FORCE BASE	AF	5
CA	MCCLELLAN AIR FORCE BASE	AF	5
CA	MIRAMAR NAVAL AIR STATION	NAVY	5
CA	MOFFETT NAVAL AIR STATION	NAVY	5
CA	MONTEREY POSTGRADUATE SCHOOL	NAVY	
CA	N. ISLAND NAVAL AIR STATION	NAVY	4
CA	NORTON AIR FORCE BASE	AF	
CA	OAKLAND ARMY BASE	ARMY	
CA	OAKLAND MIL SEALIFT COM PACIFIC	NAVY	4
CA	PALMDALE PLANT NO 42 PROD FL TST IN	AF	4
CA	POINT SUR FACILITY	NAVY	5
CA	POMONA WEAPONS IND RES PLANT	NAVY	4
CA	PORT HUENEME CONST. BATTALION CTR	NAVY	
CA	PRESIDIO OF MONTEREY	ARMY	4
CA	PRESIDIO OF SAN FRANCISCO	ARMY	4

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
CA	PT MUGU MISSILE TEST CTR	NAVY	5
CA	RIVERBANK ARMY AMMO PLANT	ARMY	5
CA	SACRAMENTO ARMY DEPOT	ARMY	5
CA	SAN BRUNO FAC ENG COM WESTERN DIV	NAVY	4
CA	SAN CLEMENTE ISLAND	NAVY	4
CA	SAN DIEGO ELEC SYS ENGINEERING CTR	NAVY	4
CA	SAN DIEGO FLEET ANTISUB WARF TRNG CT	NAVY	
CA	SAN DIEGO FLIGHT TRAINING CTR	NAVY	
CA	SAN DIEGO NAVAL BASE	NAVY	5
CA	SAN DIEGO RECRUIT DEPOT	USMC	4
CA	SAN FRANCISCO NAVAL BASE	NAVY	
CA	SAN NICOLAS ISLAND FACILITY	NAVY	4
CA	SEAL BEACH WEAPONS STA	NAVY	
CA	SHARPE ARMY DEPOT	ARMY	5
CA	SIERRA ARMY DEPOT	ARMY	
CA	SKAGGS ISLAND SEC GROUP ACTIVITY	NAVY	4
CA	STOCKTON COMMUNICATION STATION	NAVY	4
CA	SUNNYVALE WEAPONS IND RES PLANT	NAVY	4
CA	TRAVIS AIR FORCE BASE	AF	5
CA	TREASURE ISLAND STATION	NAVY	4
CA	VANDENBERG AIR FORCE BASE	AF	5
CO	ACADEMY, AIR FORCE	AF	5
CO	BUCKLEY AIR NATIONAL GUARD FACILITY	ANG	5
CO	FITZSIMMONS ARMY MEDICAL CENTER	ARMY	4
CO	FORT CARSON	ARMY	5
CO	LOWRY AIR FORCE BASE	AF	5
CO	PETERSON AIR FORCE BASE	AF	5
CO	PINYON CANYON	ARMY	5
CO	PUEBLO DEPOT ACTIVITY	ARMY	5
CO	ROCKY MOUNTAIN ARSENAL	ARMY	5
CT	BLOOMFIELD WEAPONS IND RES PLT	NAVY	4
CT	NEW LONDON SUBMARINE BASE	NAVY	4
CT	STRATFORD ARMY ENGINE PLANT	ARMY	4
CT	WINDSOR NUCLEAR POWER TRNG UNIT	NAVY	5
DC	BOLLING AIR FORCE BASE	AF	5
DC	FORT MCNAIR	ARMY	5
DC	WASH. NAVY YARD DATA AUTOMATION COM	NAVY	4
DC	WASHINGTON AUDIOVISUAL CENTER	NAVY	5
DC	WASHINGTON MARINE BARRACKS	USMC	5
DC	WASHINGTON MILITARY SEALIFT COMMAND	NAVY	4
DC	WASHINGTON NAVAL OBSERVATORY	NAVY	4
DC	WASHINGTON RESEARCH LAB	NAVY	4
DC	WASHINGTON TELECOM COM HQ	NAVY	4

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
DE	DOVER AIR FORCE BASE	AF	5
DE	REC AREA, FIRST ARMY	ARMY	4
FL	AVON PARK AIR FORCE RANGE	AF	4
FL	CAPE CANAVERAL AF STATION	AF	5
FL	CECIL FIELD AIR STATION	NAVY	5
FL	CORRY STATION TECH TRNG CTR	NAVY	5
FL	EGLIN AF AUX FIELD NO. 9	AF	5
FL	EGLIN AIR FORCE BASE	AF	5
FL	HOMESTEAD AIR FORCE BASE	AF	5
FL	HOMESTEAD SECURITY GROUP ACTIVITY	NAVY	5
FL	JACKSONVILLE FUEL DEPOT	NAVY	5
FL	JACKSONVILLE NAVAL AIR STATION	NAVY	5
FL	KEY WEST NAVAL AIR STATION	NAVY	4
FL	MACDILL AIR FORCE BASE	AF	5
FL	MAYPORT TRAINING CENTER	NAVY	5
FL	ORLANDO TRAINING CENTER	NAVY	5
FL	PANAMA CITY COASTAL SYSTEMS CENTER	NAVY	5
FL	PATRICK AIR FORCE BASE	AF	5
FL	PENSACOLA EDUCTN TRNG PROG DEV CTR	NAVY	5
FL	PENSACOLA NAVAL AIR STATION	NAVY	5
FL	PINECASTLE BOMB TARGET	NAVY	4
FL	TYNDALL AIR FORCE BASE	AF	5
FL	WHITING FIELD NAVAL AIR STATION	NAVY	5
GA	ATHENS SUPPLY CORPS SCHOOL	NAVY	5
GA	ATLANTA NAVAL AIR STATION	NAVY	5
GA	CATOOSA NATIONAL GUARD R R	NG	5
GA	DOBBINS AIR FORCE BASE	AF	5
GA	FORT BENNING	ARMY	5
GA	FORT GILLEM	ARMY	5
GA	FORT GORDON	ARMY	5
GA	FORT MCPHERSON	ARMY	5
GA	FORT STEWART	ARMY	5
GA	HUNTER ARMY AIRFIELD	ARMY	5
GA	KINGS BAY SUBMARINE BASE	NAVY	4
GA	MARINE CORPS LOGISTICS BASE, ALBANY	USMC	5
GA	MOODY AIR FORCE BASE	AF	5
GA	ROBINS AIR FORCE BASE	AF	5
IA	IOWA ARMY AMMO PLANT	ARMY	5
ID	DAVID TAYLOR R&D CENTER	NAVY	4
ID	IDAHO FALLS NUCLEAR POWER TRN UNIT	NAVY	4
ID	IDAHO NATL ENG. LAB	DOE	4
ID	KIMANA NATL GUARD TRNG AREA, RUPERT	NG	4
ID	LINCOLN COUNTY NATIONAL GUARD CENTER	NG	4

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
ID	MOUNTAIN HOME AF BASE	AF	5
ID	MOUNTAIN HOME AF RANGE	AF	4
ID	SAYLOR CREEK AIR FORCE RANGE	AF	4
IL	CHANUTE AIR FORCE BASE	AF	5
IL	FORT SHERIDAN	ARMY	5
IL	GLENVIEW NAVAL AIR STATION	NAVY	5
IL	GREAT LAKES NAVAL BASE	NAVY	5
IL	JOLIET ARMY AMMO PLANT ELWOOD	ARMY	5
IL	JOLIET ARMY AMMO PLANT KANAKEE	ARMY	5
IL	O'HARE INTL AIRPORT	AF	4
IL	PEORIA NAVY/MARINE CORPS RES CTR	USMC	5
IL	ROCK ISLAND ARSENAL	ARMY	5
IL	ROCK ISLAND NAVY/MC RES CTR	USMC	5
IL	SAVANNA DEPOT	ARMY	5
IL	SCOTT AIR FORCE BASE	AF	5
IL	ST LOUIS AREA SUPPORT CENTER	ARMY	5
IN	ATTERBURY RES FORCES AREA	ARMY	5
IN	CRANE WEAPONS SUP CENTER	NAVY	5
IN	FORT HARRISON	ARMY	5
IN	GRISSEOM AIR FORCE BASE	AF	5
IN	INDIANA ARMY AMMO PLANT	ARMY	5
IN	INDIANAPOLIS AVIONICS CENTER	NAVY	4
IN	JEFFERSON PROVING GROUND	ARMY	5
IN	NEWPORT ARMY AMMO PLANT	ARMY	5
IN	TWIN CITIES ARMY AMMO PLANT	ARMY	5
KS	FORT LEAVENWORTH	ARMY	5
KS	FORT RILEY	ARMY	5
KS	KANSAS ARMY AMMO PLANT	ARMY	5
KS	MCCONNELL AIR FORCE BASE	AF	
KS	SMOKY HILL ANG RANGE	ANG	4
KS	SUNFLOWER ARMY AMMO PLANT	ARMY	5
KY	BLUE GRASS DEPOT ACTIVITY	ARMY	5
KY	FORT CAMPBELL	ARMY	5
KY	FORT KNOX	ARMY	5
KY	LEXINGTON-BLUE GRASS DEPOT	ARMY	5
KY	LOUISVILLE ORDNANCE STATION	NAVY	5
LA	BARKSDALE AIR FORCE BASE	AF	5
LA	CLAIRBORNE AIR FORCE RANGE	AF	4
LA	ENGLAND AIR FORCE BASE	AF	5
LA	FORT POLK	ARMY	5
LA	LOUISIANA ARMY AMMO PLANT	ARMY	
LA	NEW ORLEANS CHIEF OF NAVAL RESERVE	NAVY	4
LA	NEW ORLEANS NAVAL AIR STATION	NAVY	5

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
MA	BEDFORD WEAPONS IND RES PLNT	NAVY	4
MA	EVERETT PLANT NO. 28	AF	4
MA	FORT DEVENS	ARMY	5
MA	HANSCOM AIR FORCE BASE	AF	5
MA	LYNN PLANT NO. 29	AF	4
MA	MATERIALS & MECHANICS RES CTR	ARMY	4
MA	NATICK R&D CENTER	ARMY	4
MA	NORTH GRAFTON PLANT NO. 63	AF	4
MA	OTIS AIR NATIONAL GUARD FACILITY	ANG	5
MA	PITTSFIELD WEAPONS IND RES PLANT	NAVY	4
MA	SOUTH WEYMOUTH NAVAL AIR STATION	NAVY	5
MA	WATERTON ARMY MATL & MECH RES CTR	ARMY	4
MA	WESTOVER AIR FORCE BASE	AF	5
MD	ABERDEEN PROVING GROUND	ARMY	5
MD	ACADEMY, NAVAL	NAVY	5
MD	ALLEGANY BALLISTICS LABORATORY	NAVY	4
MD	ANDREWS AIR FORCE BASE	AF	5
MD	ANDREWS AIR FACILITY	NAVY	5
MD	BETHESDA CARDEROCK LAB SHIP R&D CTR	NAVY	4
MD	BLOODSWORTH ISLAND AMPHIBIOUS BASE	NAVY	4
MD	CHELTONHAM COMMUNICATION UNIT WASH.	NAVY	4
MD	EDGEWOOD ARSENAL	ARMY	5
MD	FORT DETRICK	ARMY	5
MD	FORT GEORGE G. MEADE	ARMY	5
MD	GATEWAY ARMY AMMO PLANT	ARMY	5
MD	HALETHORPE PLANT NO. 50	AF	4
MD	HARRY DIAMOND LABORATORIES	ARMY	4
MD	INDIAN HEAD ORDNANCE STATION	NAVY	5
MD	PATUXENT RIVER NATC	NAVY	5
MD	ST. INIGOES ELECT SYS ENG ACT	NAVY	4
MD	SUITLAND INTELLIGENCE SUPPORT CENTER	NAVY	5
MD	TILGHMAN ISLAND LABORATORY	NAVY	4
MD	WHITE OAK LAB SURFACE WEAPONS CENTER	NAVY	4
ME	BANGOR INTL AIRPORT	ANG	4
ME	BRUNSWICK NAVAL AIR STATION	NAVY	5
ME	EAST MACHIAS COMMUNICATION UNIT	NAVY	4
ME	LORING AIR FORCE BASE	AF	5
ME	PORTSMOUTH SHIPYARD	NAVY	4
ME	WINTER HARBOR SEC GROUP ACTIVITY	NAVY	5
MI	CUSTER RES FORCES TRAINING AREA	ARMY	5
MI	DETROIT AIR FACILITY	NAVY	5
MI	DETROIT ARSENAL	ARMY	5
MI	GRAYLING AAF	NG	5

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
MI	GRAYLING AAF	NG	5
MI	K.I. SAWYER AIR FORCE BASE	AF	5
MI	SELFRIIDGE AGB	AF	5
MI	WURTSMITH AIR FORCE BASE	AF	5
MN	DULUTH INTL AIRPORT	ANG	4
MN	FORT SNELLING RES CENTER	ARMY	5
MN	MINNEAPOLIS ORDNANCE IND RES PLANT	NAVY	4
MN	MINNEAPOLIS-ST. PAUL INTL AIRPORT	AF	4
MN	ST. PAUL IND RES PLANT	NAVY	4
MO	CAMP CLARK	NG	5
MO	FORT CROWDER	NG	5
MO	FORT LEONARD WOOD	ARMY	5
MO	KANSAS CITY FINANCE CENTER	USMC	4
MO	LAKE CITY ARMY AMMO PLANT	ARMY	5
MO	RICHARDS-GEBAUR AIR FORCE BASE	AF	5
MO	ST. LOUIS ARMY AMMO PLANT	ARMY	5
MO	ST. LOUIS AF STATION	AF	5
MO	ST. LOUIS PLANT NO. 84	AF	4
MO	WELDON SPRINGS CHEMICAL PLANT	ARMY	4
MO	WELDON SPRINGS RES FOR TRNG INSTAL	ARMY	5
MO	WHITEMAN AIR FORCE BASE	AF	5
MS	ALLEN C. THOMPSON FIELD	AF	5
MS	CAMP MCCAIN	NG	5
MS	CAMP SHELBY	NG	5
MS	COLUMBUS AIR FORCE BASE	AF	5
MS	GULFPORT CONSTRUCTION BATTALION CTR	NAVY	5
MS	KEESLER AIR FORCE BASE	AF	5
MS	MERIDAN NAVAL AIR STATION	NAVY	5
MS	MISSISSIPPI ARMY AMMO PLANT	ARMY	5
MS	OCEAN RES & DEV ACTIVITY, NSTL	NAVY	4
MS	PASCAGOULA SHIP BLDG., CONV & REP	NAVY	4
MT	FORT MISSOULA MOUNTAIN	ARMY	5
MT	FORT WILLIAM HENRY HARRISON	ARMY	5
MT	MALMSTROM AIR FORCE BASE	AF	5
NC	CAMP LEJEUNE MARINE CORPS BASE	USMC	5
NC	CAMP MACKALL	ARMY	5
NC	CAPE HATTERAS FACILITY	NAVY	5
NC	CHERRY POINT MARINE CORPS AIR STATION	USMC	5
NC	DARE COUNTY RANGE	AF	4
NC	FORT BRAGG	ARMY	5
NC	NEW RIVER NAS (HELICOPTER)	USMC	5
NC	POPE AIR FORCE BASE	AF	5
NC	SEYMORE JOHNSON AIR FORCE BASE	AF	5

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
NC	TARHEEL ARMY MISSILE PLANT	ARMY	4
ND	GRAND FORKS AIR FORCE BASE	AF	5
ND	MINOT AIR FORCE BASE	AF	5
NE	CAMP ASHLAND	NG	5
NE	CORNHUSKER ARMY AMMO PLANT	ARMY	
NE	HASTINGS NATIONAL GUARD FACILITY	NG	
NE	MEAD NATIONAL GUARD FACILITY	NG	4
NE	OFFUTT AIR FORCE BASE	AF	5
NH	ARMY COLD REGIONS LABORATORY	ARMY	4
NH	PEASE AIR FORCE BASE	AF	5
NJ	BAYONNE MIL SEALIFT COM ATLANTIC	NAVY	4
NJ	BAYONNE MILITARY OCEAN TERMINAL	ARMY	5
NJ	COLTS NECK WEAPONS STATION	NAVY	5
NJ	EARLE WEAPON STATION	NAVY	5
NJ	FORT CHARLES WOOD	ARMY	5
NJ	FORT DIX	ARMY	5
NJ	FORT MONMOUTH	ARMY	5
NJ	LAKEHURST AIR ENG CENTER	NAVY	4
NJ	MCGUIRE AIR FORCE BASE	AF	5
NJ	PICATINNY ARS HQ ARRADCOM	ARMY	4
NJ	TRENTON AIR PROPULSION TEST CENTER	NAVY	4
NJ	WARREN GROVE NG RANGE	NG	4
NM	ALBUQUERQUE PLANT NO. 83	AF	4
NM	BOELSVELLS WATER SYS. ANNEX	AF	4
NM	CANNON AIR FORCE BASE	AF	
NM	FORT WINGATE DEPOT ACTIVITY	ARMY	
NM	HOLLOWMAN AIR FORCE BASE	AF	
HM	KIRTLAND AIR FORCE BASE	AF	
NM	MELROSE AIR FORCE RANGE	AF	4
NM	SACRAMENTO PEAK UARS	AF	4
NM	WHITE SANDS MISSILE RANGE	ARMY	
NV	FALLON NAVAL AIR STATION	NAVY	
NV	HAWTHORNE ARMY AMMO PLANT	ARMY	
NV	INDIAN SPRINGS AF AUX FIELD	AF	
NV	LAKE MEAD BASE	ARMY	4
NV	NELLIS AIR FORCE BASE	AF	
NV	NELLIS AIR FORCE RANGE	AF	4
NV	NELLIS SMALL ARMS ANNEX	AF	4
NV	WENDOVER AF AUX FIELD	AF	5
NY	ACADEMY, WEST POINT	ARMY	5
NY	BALLSTON SPA NUCLEAR POWER TRNG UNIT	NAVY	5
NY	BINGHAMTON PLANT NO. 59	AF	4
NY	BROOKLYN SUPPORT ACTIVITY	NAVY	4

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
NY	BUFFALO PLANT NO. 49	AF	4
NY	CALVERTON WEAPONS IND RES PLT	NAVY	4
NY	FORT DRUM	ARMY	5
NY	FORT HAMILTON	ARMY	5
NY	FORT TOTTEN	ARMY	5
NY	FORT WADSWORTH	ARMY	5
NY	GALEVILLE ARMY AIRPORT	ARMY	5
NY	GRIFFISSION AIR FORCE BASE	AF	5
NY	GRUMAN AEROSPACE CORP	NAVY	4
NY	HANCOCK FIELD	AF	5
NY	MODELTON PLANT NO. 38	AF	4
NY	NEW YORK NAVAL SUPPORT ACTIVITY	NAVY	4
NY	NEW YORK STATION	NAVY	5
NY	NIAGARA FALLS INTL AIRPORT	AF	4
NY	PLATTSBURGH AIR FORCE BASE	AF	5
NY	ROCHESTER WEAPONS IND RES PLANT	NAVY	4
NY	SENECA ARMY DEPOT	ARMY	5
NY	STEWART ANNEX	ARMY	5
NY	WATERVLIET ARSENAL	ARMY	4
OH	CAMP SHERMAN	NG	5
OH	CLEVELAND FINANCE CENTER	NAVY	4
OH	CLEVELAND PLANT NO. 47	AF	4
OH	COLUMBUS DEF CONST SUPPLY CTR	ARMY	5
OH	COLUMBUS WEAPONS IND RES PLANT	NAVY	4
OH	EVANDALE PLANT NO. 36	AF	4
OH	LIMA ARMY TANK CENTER	ARMY	4
OH	RAVENNA ARMY AMMO PLANT	ARMY	5
OH	RICKENBACKER AGR	AF	4
OH	WRIGHT PATTERSON AIR FORCE BASE	AF	5
OH	YOUNGSTOWN MUNICIPAL AIRPORT	AF	4
OK	ALTUS AIR FORCE BASE	AF	5
OK	CAMP GRUBER	NG	5
OK	FORT SILL	ARMY	5
OK	MC ALESTER ARMY AMMO PLANT	ARMY	5
OK	OKLAHOMA CITY AIR FORCE STATION	AF	5
OK	TINKER AIR FORCE BASE	AF	5
OK	TULSA PLANT NO. 3	AF	4
OK	VANCE AIR FORCE BASE	AF	5
OR	CAMP ADAIR	NG	5
OR	COOS HEAD FACILITY	NAVY	5
OR	KINGSLEY FIELD	AF	5
OR	PORTLAND NAVAL RES CENTER	NAVY	
OR	UMATILLA DEPOT ACTIVITY	ARMY	5

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
PA	CARLISLE BARRACKS	ARMY	5
PA	FORT INDIAN TOWN GAP	ARMY	5
PA	FORT RITCHIE	ARMY	5
PA	FRANKFORT ARSENAL	ARMY	5
PA	GREATER PITTSBURG INTL AIRPORT	AF	4
PA	HAYS ARMY AMMO PLANT	ARMY	5
PA	LEHIGH VALLEY NAVAL RES CTR	NAVY	5
PA	LETTERKENNY ARMY DEPOT	ARMY	5
PA	MECHANICSBURG FLEET MAT SUP OFFICE	NAVY	5
PA	NEW CUMBERLAND ARMY DEPOT	ARMY	5
PA	PHILADELPHIA DEF PERSONNEL SUP CNTR	ARMY	5
PA	PHILADELPHIA NAVAL BASE	NAVY	5
PA	PHILADELPHIA PUB & FORMS CENTER	NAVY	4
PA	SCRANTON ARMY AMMO PLANT	ARMY	5
PA	TOBYHANNA DEPOT	ARMY	5
PA	WARMINSTER AIR DEVP CTR	NAVY	4
PA	WILLOW GROVE AF RES FACILITY	AF	5
PA	WILLOW GROVE NAVAL AIR STATION	NAVY	5
RI	NEWPORT EDUCATION & TRAINING CENTER	NAVY	4
RI	DAVISVILLE CONST. BATTALION CTR	NAVY	5
RI	FORT NATHANIEL GREEN	ARMY	5
RI	PROVIDENCE NAVAL RES CENTER	NAVY	5
RI	QUONSET POINT NAVAL AIR STATION	NAVY	5
SC	CHARLESTON AIR FORCE BASE	AF	5
SC	CHARLESTON NAVAL BASE	NAVY	5
SC	CHARLESTON WEAPON STATION	NAVY	5
SC	FORT JACKSON	ARMY	5
SC	MARINE CORPS AIR STA., BEAUFORT	USMC	5
SC	MCENTIRE AIR NATIONAL GUARD FACILITY	ANG	5
SC	MYRTLE BEACH AIR FORCE BASE	AF	5
SC	PARRIS IS. MC REC DPT	USMC	4
SC	POINSETT AIR FORCE RANGE	AF	4
SC	SHAW AIR FORCE BASE	AF	5
SD	ELLSWORTH AIR FORCE BASE	AF	5
SD	JOE FOSS FIELD	ANG	5
TN	ARNOLD AIR FORCE STATION	AF	5
TN	BRISTOL WEAPONS IND RES PLT	NAVY	4
TN	HOLSTON ARMY AMMO PLANT	ARMY	5
TN	MCGHEE TYSON AIRPORT	AF	5
TN	MEMPHIS DEFENSE DEPOT	ARMY	5
TN	MEMPHIS NAVAL AIR STATION	NAVY	5
TN	MILAN ARMY AMMO PLANT	ARMY	5
TN	VOLUNTEER ARMY AMMO PLANT	ARMY	5

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING EASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
TX	BERGSTROM AIR FORCE BASE	AF	5
TX	BROOKS AIR FORCE BASE	AF	5
TX	CAMP BULLIS	ARMY	5
TX	CAMP SWIFT	NG	5
TX	CARSWELL AIR FORCE BASE	AF	5
TX	CHASE FIELD NAVAL AIR STATION	NAVY	5
TX	CORPUS CHRISTI NAVAL AIR STATION	NAVY	5
TX	DALLAS NAVAL AIR STATION	NAVY	5
TX	DYESS AIR FORCE BASE	AF	5
TX	FORT BLISS	ARMY	
TX	FORT HOOD	ARMY	5
TX	FORT SAM HOUSTON	ARMY	5
TX	FORT WOLTERS	ARMY	5
TX	FORT WORTH PLANT NO. 4	AF	4
TX	GOODFELLOW AIR FORCE BASE	AF	5
TX	KELLY AIR FORCE BASE	AF	5
TX	KINGSVILLE NAVAL AIR STATION	NAVY	5
TX	LACKLAND AIR FORCE BASE	AF	5
TX	LAUGHLIN AIR FORCE BASE	AF	5
TX	LONE STAR ARMY AMMO PLANT	ARMY	5
TX	LONGHORN ARMY AMMO PLANT	ARMY	5
TX	MATAGORDA AIR FORCE RANGE	AF	5
TX	MCGREGOR WEAPONS IND RES	NAVY	4
TX	RANDOLPH AIR FORCE BASE	AF	5
TX	RED RIVER ARMY DEPOT	ARMY	5
TX	REESE AIR FORCE BASE	AF	
TX	SAGINAW ARMY AIRCRAFT PLANT	ARMY	4
TX	SHEPPARD AIR FORCE BASE	AF	5
UT	CAMP WILLIAMS	NG	
UT	CORINNE PLANT NO. 78	AF	4
UT	DUGWAY PROVING GROUND	ARMY	
UT	FORT DOUGLAS	ARMY	
UT	GREEN RIVER TEST COMPLEX	ARMY	4
UT	HERCULES POWDER-BACCHUS WORKS	NAVY	4
UT	HILL AIR FORCE BASE	AF	
UT	HILL AIR FORCE RANGE	AF	
UT	OGDEN DEFENSE DEPOT	ARMY	
UT	TOOELE ARMY DEPOT NORTH	ARMY	
UT	TOOELE ARMY DEPOT SOUTH AREA	ARMY	
UT	WENDOVER AIR FORCE RANGE	AF	4
VA	ALEXANDRIA FAC ENG COMMAND HQ	NAVY	4
VA	ARLINGTON CHIEF OF NAVAL MATERIAL	NAVY	4
VA	ARLINGTON CIVIL PERSONNEL COM	NAVY	4

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
VA	ARLINGTON HALL STATION	ARMY	5
VA	ARLINGTON MARINE CORPS HEADQUARTERS	USMC	4
VA	CAMERON STATION	ARMY	5
VA	CAMP PEARY, EXP. TRNG ACTIVITY	NAVY	5
VA	CHEATHAM SUPPLY ANNEX	NAVY	5
VA	CHESAPEAKE SEC GROUP ACTIVITY NW	NAVY	5
VA	DAHLGREN SURFACE WEAPONS CENTER	NAVY	5
VA	DAM NECK FLEET COMB TRNG CTR ATLANTIC	NAVY	5
VA	FORT BELVOIR	ARMY	5
VA	FORT EUSTIS	ARMY	5
VA	FORT HILL, AP	ARMY	5
VA	FORT LEE	ARMY	5
VA	FORT LEE AIR FORCE STATION	AF	5
VA	FORT MONROE	ARMY	5
VA	FORT MYER	ARMY	5
VA	FORT PICKETT	ARMY	5
VA	FORT STORY	ARMY	5
VA	LANGLEY AIR FORCE BASE	AF	5
VA	LITTLE CREEK AMPHIBIOUS BASE	NAVY	4
VA	MILITARY PERSONNEL COMMAND	NAVY	4
VA	NORFOLK NAVAL BASE	NAVY	5
VA	NORFOLK SHIPYARD	NAVY	4
VA	OCEANA NAVAL AIR STATION	NAVY	5
VA	QUANTICO MC DEV & ED CM	USMC	5
VA	RADFORD ARMY AMMO PLANT	ARMY	5
VA	RICHMOND DEF GENERAL SUPPLY CENTER	ARMY	5
VA	VINT HILLS FARMS STATION	ARMY	5
VA	YORKTOWN WEAPONS STATION	NAVY	5
VT	BURLINGTON INTL AIRPORT	AF	4
VT	ETHAN ALLEN FIRE RANGE	ARMY	4
VT	ETHAN ALLEN AIR NATL GUARD FACILITY	ANG	5
WA	BANGOR SUBMARINE BASE	NAVY	4
WA	BREMERTON SHIPYARD	NAVY	4
WA	CUSICK SURVIVAL TRAINING SITE	AF	4
WA	FAIRCHILD AIR FORCE BASE	AF	5
WA	FORT LEWIS	ARMY	5
WA	HUCKLEBERRY CREEK MTN TRNG INSTAL	ARMY	4
WA	JIM CREEK RADIO STATION	NAVY	4
WA	KEYPORT UNDERSEA WARFARE ENG STN	NAVY	4
WA	MCCHORD AIR FORCE BASE	AF	5
WA	PACIFIC BEACH FACILITY	NAVY	5
WA	PUGET SOUND SHIPYARD	NAVY	4
WA	SEATTLE NAVAL BASE	NAVY	5

TABLE A-1 STEPS 4 AND 5: MAJOR MILITARY INSTALLATIONS
CONSIDERED AS POTENTIAL MAIN OPERATING BASES¹

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
WA	WHIDBEY IS NAVAL AIR STATION	NAVY	4
WA	YAKIMA FIRING CENTER	ARMY	5
WI	BADGER ARMY AMMO PLANT	ARMY	5
WI	CLAM LAKE ELEC SYS ENG CENTER	NAVY	4
WI	FORT MC COY	ARMY	5
WI	GENERAL MITCHELL FIELD	AF	5
WI	SUN PRAIRIE FAMILY HOUSING	ARMY	4
WI	TRUAX FIELD	ANG	5
WI	VOLK FIELD	ANG	5
WI	WEST SILVER SPRINGS RES COMM	ARMY	4
WV	EASTERN W. VIRGINIA REG AIRPORT	ANG	5
WV	KANAWHA COUNTY AIRPORT	ANG	5
WV	SUGAR GROVE RADIO STATION	NAVY	4
WY	CHEYENNE MUNICIPAL AIRPORT	ANG	4
WY	F.E. WARREN AIR FORCE BASE	AF	
WY	LANDER NATIONAL GUARD FACILITY	NG	5
WY	LOVELL NATIONAL GUARD FACILITY	NG	5
WY	SHERIDAN NATIONAL GUARD FACILITY	NG	5

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APPENDIX B

HARD SILO IN PATTERNED ARRAY

EXCLUSIONARY CRITERIA

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APPENDIX B

HARD SILO IN PATTERNED ARRAY
EXCLUSIONARY CRITERIA

Criteria statements below are organized by goals and level of application. Full criteria descriptions, including definitions and rationale, follow and can be referenced using their alphanumeric designator.

Throughout, a distinction between "exclude" and "avoid" is maintained. "Exclude" is used in exclusionary criteria to indicate elimination of potential deployment areas or Main Operating Bases from further consideration. "Avoid" is used to indicate that, whenever possible, alternative areas are selected.

The alphanumeric system is illustrated by the following example:

1

1

1

X

1

GOAL-

SUBGOAL-

OBJECTIVE-

LEVEL OF
APPLICATION-

CRITERION-

HARD SILO IN PATTERNED ARRAY
EXCLUSIONARY CRITERIA
Page 1 of 2

- Goal 1: Maximize System Effectiveness
 - 1.1 Maximize System Survivability
 - 1.1.1 Optimize Attack Price
Minimum Parcel Size (1.1.1.A.1)
 - 1.1.2 Maximize Hardness
Depth to Rock (1.1.2.A.1)
Depth to Water (1.1.2.A.2)
- Goal 2: Optimize System Operability
 - 2.1 Optimize Deployment Area Operation
 - 2.1.3 Maximize Operation Effectiveness
Slope (2.1.3.A.1)
 - 2.3 Maximize Main Operating Base Effectiveness
 - 2.3.1 Consider Functional Support Capability
Distance to Main Operating Base
(2.3.1.A.1)
 - Main Operating Base Size (2.3.1.A.2)
 - Urban Population Surround (2.3.1.A.3)
 - Suitable Existing Installation
(2.3.1.A.4)
- Goal 3: Optimize System Practicability
 - 3.2 Optimize Constructibility
 - 3.2.1 Minimize Deployment Construction Costs
Minimum Number of Silos (3.2.1.A.1)
- Goal 4: Minimize Public Impact
 - 4.1 Minimize Economic Impacts
 - 4.1.1 Avoid High Value Land
Urbanized Areas (4.1.1.A.1)
 - 4.1.2 Avoid High Value Economic Resources
Known Geothermal Resource Areas
(4.1.2.A.1)

HARD SILO IN PATTERNED ARRAY
EXCLUSIONARY CRITERIA
Page 2 of 2

- Goal 5: Minimize Environmental Impacts
- 5.3 Minimize Impacts on Special Status Lands
 - 5.3.1 Exclude Legal/Regulatory Exclusion Areas
 - Wilderness Areas (5.3.1.A.1)
 - National/State Monuments (5.3.1.A.2)
 - National Recreation Areas (5.3.1.A.3)
 - National/State Parks (5.3.1.A.4)
 - Wild and Scenic Rivers (5.3.1.A.5)
 - American Indian Reservations (5.3.1.A.6)
 - Wildlife Refuges and Game Preserves (5.3.1.A.7)

GOAL 1: Maximize System Effectiveness

SUBGOAL 1.1: Maximize System Survivability

OBJECTIVE 1.1.1: Optimize Attack Price

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 1.1.1.A.1: Exclude suitable area that can not accommodate at least one grouping of 50 silos.

CRITERION DEFINITION: Pattern basing involves groupings of silos in specific configurations of a minimum of 50 silos in a generally north-south array. Silo locations must meet the suitable area requirements (Criteria 1.1.2.A.1 and 1.1.2.A.2).

The minimum area requirement is based on a nominal 1,500-foot spacing (see Criterion 1.1.1.E.1). Additional area is provided for launch control facilities, security, and command, control, and communication.

CRITERION RATIONALE: Criteria are based on the siting pattern for the layout of a single group to allow survivability for the system and to provide operational efficiencies.

GOAL 1: Maximize System Effectiveness

SUBGOAL 1.1: Maximize System Survivability

OBJECTIVE 1.1.2: Maximize Hardness

LEVEL OF APPLICATION: A - Regional Exclusionary

CRITERION STATEMENT 1.1.2.A.1: Exclude all areas where depth to rock is less than 200 feet from surface.

CRITERION DEFINITION: Rock is defined as all lithified earth materials having a seismic p-wave velocity greater than 7,000 feet per second when wet or 5,000 feet per second when dry and having a compression strength in excess of 2,000 pounds per square inch. For screening purposes, rock may be determined by lithologic features which would be expected to result in greater than 7,000 feet per second velocities. Caliche is not excluded under this criterion even though its p-wave velocity may exceed 7,000 feet per second.

CRITERION RATIONALE: The criterion is based on silo depth nominally 175 feet. To achieve an acceptable degree of survivability for the system, depth to rock must be below the silo bottom. The silo should be situated in a site where depth to rock does not cause the primary shock wave of the induced overpressure to be reflected so as to increase the destructive potential of a nuclear blast to an unacceptable level.

For screening, 200 feet was used to provide a high degree of confidence, allow for changes in silo design, and preclude the need to penetrate through rock during construction.

GOAL 1: Maximize System Effectiveness

SUBGOAL 1.1: Maximize System Survivability

OBJECTIVE 1.1.2: Maximize Hardness

LEVEL OF APPLICATION: A - Regional Exclusionary

CRITERION STATEMENT 1.1.2.A.2: Exclude areas where depth to water is less than 200 feet from surface. Exclude areas of surface water and areas of perennial drainage.

CRITERION DEFINITION: "Water" includes both ground and surface water. Ground water is water contained in the saturated zone of unconfined aquifers or in confined (artesian) aquifers. Surface water is defined as perennial streams, lakes and rivers. It does not include sheet flow or intermittent drainages.

CRITERION RATIONALE: The criterion is based on silo depth, nominally 175 feet. To achieve an acceptable degree of survivability for the system, depth to water must be below the silo bottom. The silo should be situated in a site where depth to water does not cause the primary shock wave of the induced overpressure to be reflected so as to increase the destructive potential of a nuclear blast to an unacceptable level.

For screening, 200 feet was used to provide a high degree of confidence, allow for changes in silo design and preclude the need to excavate below the water table during construction.

GOAL 2: Optimize System Operability

SUBGOAL 2.1: Optimize Deployment Area Operation

OBJECTIVE 2.1.3: Maximize Operation Effectiveness

LEVEL OF APPLICATION: A - Regional Exclusionary

CRITERION STATEMENT 2.1.3.A.1: Exclude all areas with slope exceeding 10 percent from consideration for Hard Silo deployment.

CRITERION DEFINITION: Slope is determined by existing terrain. The slope of the natural terrain cannot exceed 10 percent.

CRITERION RATIONALE: In addition to making missile transport difficult, steep slopes compromise security by limiting visual and line-of-sight cover. The 1,500-foot spacing between silos makes it difficult and costly to modify existing terrain to facilitate transporter-erector access and maneuvering.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 2.3.1.A.1: The deployment area for pattern basing is located no more than 50 radial miles from the main operating base.

CRITERION DEFINITION: Suitable area will be examined within a 50 mile radius of potential Main Operating Bases.

CRITERION RATIONALE: In order to maintain operational efficiencies, the Main Operating Base must be close to the deployment area to minimize travel of maintenance and security personnel to a remotely located work center in the deployment area. This is particularly significant when large groups of personnel travel to a maintenance complex in the deployment area.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 2.3.1.A.2: Exclude from consideration all potential Main Operating Bases of less than two-thirds (2/3) square mile gross area.

CRITERION DEFINITION: Gross area is a measure of total land on the installation.

CRITERION RATIONALE: The areas on a Main Operating Base required to contain the facilities to support operations and maintenance activities for the weapon system would be a minimum of two-thirds (2/3) square miles.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 2.3.1.A.3: Exclude from consideration all potential Main Operating Bases that are completely surrounded by urbanized areas.

CRITERION DEFINITION: An urbanized area is defined for this criterion by the Census Bureau as a central city or cities and surrounding closely settled territory comprising a minimum total population of 50,000. The closely settled surrounding territory may comprise incorporated areas with populations of 2,500 or more or other places with a density of at least 1,000 persons per square mile.

CRITERION RATIONALE: Installations that are completely surrounded by urbanized areas have little or no flexibility for expansion or adjustments in land use that may be required by the addition of a new mission.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 2.3.1.A.4: Exclude inappropriate Department of Defense installations as Main Operating Bases.

CRITERION DEFINITION: Include as appropriate Department of Defense installations all land under current Department of Defense jurisdiction with existing facilities/infrastructure that may contribute to the support of a major operational mission. "Current Department of Defense jurisdiction" includes acquired land held in fee or long term lease, or presently withdrawn public domain land for any military purpose. The major operational mission support would include area for nuclear weapons handling, aerospace vehicle equipment maintenance facilities and operational and personnel support facilities. Examples of existing Department of Defense lands that would not likely contribute to the support of a major operational mission include, but are not limited to, hospitals, finance centers, and islands.

CRITERION RATIONALE: Installations not considered are those with no infrastructure or that have a specialized use and do not provide the personnel support capabilities commonly found on Air Force, Navy, and Marine Corps bases or stations, or on Army posts or forts.

GOAL 3: Optimize System Practicability

SUBGOAL 3.2: Optimize Constructibility

OBJECTIVE 3.2.1: Minimize Deployment Construction Costs

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 3.2.1.A.1: Exclude Main Operating Bases without sufficient suitable area to deploy 100 Small ICBMs.

CRITERION DEFINITION: Sufficient suitable area to deploy 100 Small ICBMs was defined as twice the amount of area necessary to actually deploy 100 missiles in order to account for area lost for environmental and socioeconomic reasons.

CRITERION RATIONALE: System costs in terms of personnel requirements and facilities increase with the number of main operating bases. A Main Operating Base with less than 100 silos cannot justify the increased system cost of operation per silo.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.1: Avoid High Value Land

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 4.1.1.A.1: Exclude urbanized areas from consideration for Hard Silo deployment.

CRITERION DEFINITION: An urbanized area is defined by the Census Bureau as a central city or cities and surrounding closely settled territory comprising a minimum total population of 50,000. The closely settled surrounding territory may be comprised of incorporated areas of 2,500 or more population or other places with a density of at least 1,000 persons per square mile.

CRITERION RATIONALE: Land in urbanized areas is more expensive and deployment in these areas would remove this land from other social or economic uses.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.2: Avoid High Value Economic Resources

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 4.1.2.A.1: Exclude Known Geothermal Resource Areas (KGRAs) from consideration for operational deployment of the Hard Silo system.

CRITERION DEFINITION: KGRAs were defined as sources of geothermal energy which are currently developed or may be economically feasible to develop for commercial use.

CRITERION RATIONALE: Deployment within KGRAs may prevent economic development of valuable energy resources.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

**OBJECTIVE 5.3.1: Exclude Legal/Regulatory
Exclusion Areas**

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 5.3.1.A.1: Exclude lands within the boundaries of wilderness areas from consideration for operational deployment of the Hard Silo system.

CRITERION DEFINITION: Wilderness is federally owned land "untrammeled" by man, nominated by the Secretary of the Interior and designated by Congress as a wilderness area.

CRITERION RATIONALE: For wilderness areas, statute prohibits commercial enterprise, permanent roads and, except as necessary to manage the area for wilderness purposes, temporary roads, use of motorized vehicles or other mechanical transport, and structures or installations within the area boundary. These restraints preclude siting Small ICBM in wilderness areas without specific Congressional withdrawal of the area from the National Wilderness Preservation System.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

**OBJECTIVE 5.3.1: Exclude Legal/Regulatory
Exclusion Areas**

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 5.3.1.A.2: Exclude land within the boundaries of national and state monuments from consideration for operational deployment of the Hard Silo system.

CRITERION DEFINITION: National monuments are historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the government of the United States that have been so designated by Presidential proclamation. State monuments have similar significance but the designation has been made by state authorities.

CRITERION RATIONALE: In order to protect such resources as national monuments, National Park Service law require Congressional approval of certain construction activities on national monument lands. For non-Department of Defense controlled public lands, the Air Force seeks to avoid actions that would require legislative reallocation of lands set aside for a particular purpose.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

**OBJECTIVE 5.3.1: Exclude Legal/Regulatory
Exclusion Areas**

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 5.3.1.A.3: Exclude land within the boundaries of National Recreation Areas from consideration for operational deployment of the Hard Silo system.

CRITERION DEFINITION: National recreation areas are lands within the National Park, National Forest or National Wildlife Refuge Systems that have been legislatively set aside to assure that American people of present and future generations will have adequate outdoor recreation resources. These are administered by the Department of Interior and are developed for various recreational activities.

CRITERION RATIONALE: Congress has declared that outdoor recreation areas are scarce resources that should be protected. Each specific area has been established by a separate piece of legislation and some have separate management regulations. For non-Department of Defense controlled public lands, the Air Force seeks to avoid actions that would require legislative reallocation of lands set aside for a particular purpose.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

**OBJECTIVE 5.3.1: Exclude Legal/Regulatory
Exclusion Areas**

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 5.3.1.A.4: Exclude lands within the statutory boundaries of national parks and state parks from consideration for operational deployment of the Hard Silo system.

CRITERION DEFINITION: National parks are lands set aside by Congressional action in order to be "unimpaired for the enjoyment of future generations." State parks are lands set aside by state action for similar purposes.

CRITERION RATIONALE: Among the regulations for protection of national park resources are the requirements for Congressional approval of certain construction activities within the boundaries of the parks. In order to comply with the state purpose of the National Park Service, construction on such lands should be avoided. For non-Department of Defense controlled public lands, the Air Force seeks to avoid actions that would require legislative reallocation of lands set aside for a particular purpose.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

**OBJECTIVE 5.3.1: Exclude Legal/Regulatory
Exclusion Areas**

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 5.3.1.A.5: Exclude areas included within the wild and scenic rivers system for operational deployment of the Hard Silo system.

CRITERION DEFINITION: Rivers potentially subject to protection under the Wild and Scenic Rivers Act are those which, "with their immediate environments possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values." The wild and scenic rivers system comprises rivers fitting the above definition which have been authorized by an act of Congress or by acts of state legislatures.

CRITERION RATIONALE: Components of the national wild and scenic rivers system must be administered so as to protect and enhance the values that caused them to be included in the system. In such administration, primary emphasis is given to protecting esthetic, scenic, historic, archeologic, and scientific features. It is unlikely that any portion of a Hard Silo system could be constructed in the immediate environment of a wild and scenic river without substantially interfering with public use and enjoyment of those values that made the river eligible for inclusion in the system.

GOAL 5: Minimize Environment Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

**OBJECTIVE 5.3.1: Exclude Legal/Regulatory
Exclusion Areas**

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 5.3.1.A.6: Exclude areas in American Indian reservations and those new or expanded areas formally proposed by the Department of Interior to the Congress for Indian Trust status.

CRITERION DEFINITION: American Indian reservations are those geographic areas which have been established by federal action for the use of recognized Indian tribes. The lands are held in trust by the United States government for the beneficiaries--American Indians.

CRITERION RATIONALE: The United States government, as trustee, has a duty to preserve and protect these lands for the beneficiaries' use. Use of the lands, inconsistent with the original purpose for creating the reservations, would require extraordinary administrative action by the Secretary of the Interior or by Congress.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

**OBJECTIVE 5.3.1: Exclude Legal/Regulatory
Exclusion Areas**

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 5.3.1.A.7: Exclude lands within the boundaries of wildlife refuges and game preserves from consideration for operational deployment of the Hard Silo system.

CRITERION DEFINITION: Wildlife refuges and game preserves are those areas set aside by federal or state law or regulation for the protection and conservation of fish, wildlife or plant species. This includes wildlife ranges, game ranges, wildlife management areas, waterfowl production areas, botanical reserves and other similar areas.

CRITERION RATIONALE: Wildlife refuges and game preserves have been variously designated due to their unique characteristics. Generally, they are managed to protect and conserve these characteristics. Only uses compatible with the purposes for which these areas are established would be allowed without significant administrative action. These areas also tend to be the focus of public interest when projects in their vicinity are proposed.

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APPENDIX C

HARD SILO IN PATTERNED ARRAY

BASING MODE

EVALUATIVE CRITERIA

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APPENDIX C

HARD SILO IN PATTERNED ARRAY EVALUATIVE CRITERIA

Criteria statements below are organized by goals and level of application. Full criteria descriptions, including definitions and rationale, follow and can be referenced using their alphanumeric designator.

The alphanumeric system is illustrated by the following example:

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GOAL-

SUBGOAL-

OBJECTIVE-

**LEVEL OF
APPLICATION-**

CRITERION-

HARD SILO IN PATTERNED ARRAY

EVALUATIVE CRITERIA FOR AREA NARROWING

Page 1 of 3

- Goal 1: Maximize System Effectiveness
- 1.2 Optimize Command, Control, and Communication Capability
 - 1.2.2 Maximize Security
 - Public Interface (1.2.2.B.1)
 - Infrastructure Separation (1.2.2.B.2)
 - 1.4 Optimize System Adaptability/Flexibility
 - 1.4.2 Consider System Expandability
 - Suitable Area (1.4.2.B.1)

Goal 2: Optimize System Operability

- 2.1 Optimize Deployment Area Operations
 - 2.1.1 Maximize Accessibility to Maintenance Facilities
 - Accessibility to Deployment Areas (2.1.1.B.1)
- 2.3 Maximize Main Operating Base Effectiveness
 - 2.3.1 Consider Functional Support Capability
 - Mission Changes (2.3.1.B.5)
 - Distance to Support Community (2.3.1.B.6)
 - 2.3.2 Consider Land Availability
 - Adequate Land (2.3.2.B.1)
 - Ownership (2.3.2.B.2)
 - 2.3.3 Consider Infrastructure Support Capability
 - Water Obtainability (2.3.3.B.1)
 - Power (2.3.3.B.2)
 - Energy (2.3.3.B.3)
 - Waste Water (2.3.3.B.4)
 - Solid Waste (2.3.3.B.5)
 - Storm Drains (2.3.3.B.6)
 - 2.3.4 Consider Transportation Availability
 - Air (2.3.4.B.1)
 - Highway Access (2.3.4.B.2)
 - Railroad (2.3.4.B.3)
- 2.4 Maximize Mission Compatibility
 - 2.4.2 Maximize Integration Potential
 - Type of Base (2.4.2.B.1)
 - Relationship to Existing Missions (2.4.2.B.2)
- 2.5 Maximize Quality of Life
 - 2.5.1 Provide Adequate Support Services
 - Support Community (2.5.1.B.1)
 - Housing Availability (2.5.1.B.2)

HARD SILO IN PATTERNED ARRAY

EVALUATIVE CRITERIA FOR AREA NARROWING

Page 2 of 3

Goal 3: Optimize System Practicability

3.2 Optimize Constructibility

 3.2.1 Minimize Deployment Area Construction Costs

 Aggregate Availability (3.2.1.B.1)

 Terrain (3.2.1.B.2)

 Water Availability (3.2.1.B.3)

Goal 4: Minimize Public Impact

4.1 Minimize Economic Impacts

 4.1.1 Avoid High Value Land

 Energy/Mineral (4.1.1.B.1)

 Prime and Unique Farmland (4.1.1.B.2)

 Timberland (4.1.1.B.3)

 Future Development (4.1.1.B.4)

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GOAL 1: Maximize System Effectiveness

SUBGOAL 1.2: Optimize Command, Control, and Communication Capability

OBJECTIVE 1.2.2: Maximize Security

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 1.2.2.B.1: Preference was given to Main Operating Bases where the interface between the Hard Silo system and the resident population in the Deployment Area is minimal.

CRITERION DEFINITION: Population interface is the density of inhabited structures in the Deployment Area.

CRITERION RATIONALE: Minimum population interface serves to enhance area security by avoiding urbanized and developing areas. Inhabited structures indicate the relative density and distribution of populated areas in the Deployment Area.

GOAL 1: Maximize System Effectiveness

SUBGOAL 1.2: Optimize Command, Control, and Communication Capability

OBJECTIVE 1.2.2: Maximize Security

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 1.2.2.B.2: Preference was given to Main Operating Bases which minimize the interface between the Hard Silo system and major highways, utility lines, and highway/utility corridors within the Deployment Area.

CRITERION DEFINITION: Major highways include interstate and state highways and may include major county arterials that are important to local transportation. Utility lines to be considered include electrical transmission lines, oil and gas pipelines and may include primary water or sewer lines. Transportation corridors are areas contiguous to existing highways or acquired for planned new highways. Utility corridors are those areas currently owned or under acquisition by utility departments or companies and under active design or construction.

CRITERION RATIONALE: Minimum interface with major transportation and utility arterials serves to enhance area security by minimizing contact with the public.

GOAL 1: Maximize System Effectiveness

SUBGOAL 1.4: Optimize System Adaptability/Flexibility

OBJECTIVE 1.4.2: Consider System Expandability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 1.4.2.B.1: Preference was given to Main Operating Bases that have larger Deployment Areas.

CRITERION DEFINITION: Deployment Areas are those suitable parcels which meet all Hard Silo exclusionary criteria.

CRITERION RATIONALE: Siting a system at a base that supports a large amount of suitable area provides the opportunity for expanding the system and provides greater flexibility in siting the parcels.

GOAL 2: Optimize System Operability

SUBGOAL 2.1: Optimize Deployment Area Operations

OBJECTIVE 2.1.1: Maximize Accessibility to Maintenance Facilities

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.1.1.B.1: Preference was given to Main Operating Bases with good access to the potential Deployment Areas.

CRITERION DEFINITION: Accessibility was measured as the distance in road miles from the Main Operating Base to the potential Deployment Areas.

CRITERION RATIONALE: Proximity to the Main Operating Base is a measure of operational efficiency and costs. Increased travel distance will affect operational efficiency by increasing time required for transport of operation and maintenance personnel to the Deployment Area.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.5: Preference was given to Main Operating Bases with recent or anticipated mission changes that increase a Main Operating Base's support capability.

CRITERION DEFINITION: Main Operating Base mission changes are changes in personnel and/or facilities that are associated with a major mission.

CRITERION RATIONALE: A base that has recently lost or expects to lose a major mission may have excess facilities space and/or support capacity. Also, replacing a lost mission with a new one can reduce impacts in local communities. Conversely, a base that is already experiencing growth may be at or above its absorption capacity.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.6: Preference was given to Main Operating Bases that are easily accessible from the support community.

CRITERION DEFINITION: Accessibility to the support community is the distance from the Main Operating Base in road miles to the border of the nearest support community. A support community is one that is of sufficient size to provide typical services (greater than 25,000 population).

CRITERION RATIONALE: Close proximity of a support community enhances the likelihood that public and private sectors can respond to induced demands for goods, services, and facilities. Close proximity also minimizes the time required for transport of services and personnel that normally report to the Main Operating Base before going to the deployment area.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.2: Consider Land Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.2.B.1: Preference was given to Main Operating Bases with adequate land for locating the Hard Silo system facilities and other components without functional land use concerns.

CRITERION DEFINITION: Available land on base is the quantity of land with characteristics to accommodate the Hard Silo mission.

CRITERION RATIONALE: Available land on an existing Main Operating Base is required to efficiently support the mission and to provide the capability for timely construction of critical facilities to meet the Initial Operational Capability need date. Available land must be suitable to support standard construction methods and minimize impacts to existing uses.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.2: Consider Land Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.2.B.2: Preference was given to Main Operating Bases that contain available land with ownership that would minimize the time of official land use change for support of the Small ICBM system.

CRITERION DEFINITION: Land ownership is the owner/manager of land on the Main Operating Base that is potentially available for the Hard Silo mission.

CRITERION RATIONALE: The order of preference for ownership of available land on base is DoD fee-owned, DoD leased land, or DoD withdrawn land. The rationale for ordering the land ownership categories arises from consideration of different time durations required to change the official land use of land with these ownership types. DoD fee-owned land poses the least time constraint while DoD withdrawn land may entail the longest and most complicated change of land use and presents the greatest schedule risk.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.1: Preference was given to Main Operating Bases where sufficient water can be developed or obtained by appropriation or purchase/transfer for operations and limited construction.

CRITERION DEFINITION: A Main Operating Base is deemed to have sufficient water for operations and construction of the Hard Silo system when the water can be obtained without exercising condemnation.

CRITERION RATIONALE: Availability of water affects both system constructibility and operability. It is preferable to develop unused water or purchase/transfer water from existing uses.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.2: Preference was given to Main Operating Bases with power systems that can meet project requirements.

CRITERION DEFINITION: Project requirement for power is the amount of power needed from public/private utilities plus any co/self generation systems to meet the Small ICBM system construction and operational requirements.

CRITERION RATIONALE: Deployment costs are reduced when existing power systems are adequate or can be easily expanded to accommodate project demands.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.3: Preference was given to Main Operating Bases with heating systems that can meet project requirements.

CRITERION DEFINITION: The project will require an on-base heating system with adequate excess capacity to accommodate the Small ICBM mission or a system that could easily be expanded to meet project requirements.

CRITERION RATIONALE: Deployment costs are reduced when no modifications to the existing heating system are required. If modifications are required, costs would be minimized if the existing system could easily be expanded.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.4: Preference was given to Main Operating Bases with waste-water treatment and collection systems that can meet project requirements.

CRITERION DEFINITION: The project will require a waste-water treatment and collection system that can accommodate the Small ICBM mission.

CRITERION RATIONALE: Cost of new facilities is reduced to the degree that existing waste-water treatment and collection systems are capable of accommodating growth.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.5: Preference shall be given to Main Operating Bases with solid waste disposal systems that can meet project requirements.

CRITERION DEFINITION: The project will require a solid waste disposal system that is capable of accommodating the Small ICBM mission.

CRITERION RATIONALE: Siting and development of new landfills is a lengthy and complex process. Cost and land requirements are lessened if existing landfill or disposal systems are large enough to accommodate growth.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.6: Preference was given to Main Operating Bases with storm drainage systems that can meet project requirements.

CRITERION DEFINITION: The project requires a storm drainage system capable of accommodating increased runoff.

CRITERION RATIONALE: Additional runoff from Small ICBM related construction and facilities may cause flooding and affect water quality if existing capacities are exceeded. Presence of existing storm drainage systems capable of accommodating growth will reduce the cost of new facilities.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.1: Preference was given to Main Operating Bases close to capable airfields.

CRITERION DEFINITION: Airfield capability is a function of length, instrument capability, and location of a runway relative to the base.

CRITERION RATIONALE: The presence of an airfield provides flexibility in logistics support and travel.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.2: Preference was given to Main Operating Bases with adequate highway access.

CRITERION DEFINITION: Highway access is determined by type, capacity, and location of access roads, quality of interface with base roads, and congestion.

CRITERION RATIONALE: Adequate highway access facilitates movement of missile components, maintenance equipment, and personnel on and off base.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.3: Preference shall be given to Main Operating Bases with railroad freight service.

CRITERION DEFINITION: Railroad freight service is the existence of a railroad line, or spur, within the vicinity of the Main Operating Base that could support the Small ICBM mission.

CRITERION RATIONALE: Railroad freight service allows missile components and general supplies to be transported directly to the base. Existing on-base capacity and/or rights-of-way from the existing railroad freight service to the Main Operating Base reduces costs of land acquisition and construction for rail extension.

GOAL 2: Optimize System Operability

SUBGOAL 2.4: Maximize Mission Compatibility

OBJECTIVE 2.4.1: Maximize Integration Potential

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.4.2.B.1: Preference was given to Main Operating Bases that have a support infrastructure that is compatible with Air Force and Small ICBM operations.

CRITERION DEFINITION: Compatible support infrastructure is the degree to which the current operating command is similar to that of the Small ICBM mission. The order of preference for operating command is: (1) existing ICBM, (2) Strategic Air Command as the host major command, (3) Air Force (any other major command), and (4) other military.

CRITERION RATIONALE: Because Hard Silo is an Air Force mission and Strategic Air Command is the operating command, greater potential efficiencies could result from deployment at an existing Strategic Air Command base through use of appropriate facilities and experienced personnel. Mission and organizational compatibilities are greater within the Air Force than between the Air Force and other branches of services, as well as within military organizations rather than between military and non-military organizations.

GOAL 2: Optimize System Operability

SUBGOAL 2.4: Maximize Mission Compatibility.

OBJECTIVE 2.4.1: Maximize Integration Potential

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.4.2.B.2: Preference was given to Main Operating Bases with larger Deployment Areas that can accommodate the Hard Silo mission within the base itself, or on other existing DoD/DoE installations within 50 miles of the base.

CRITERION DEFINITION: On-installation Deployment Areas are those suitable parcels located either within the Main Operating Base, or within other DoD/DoE installations within 50 miles of the Main Operating Base, which meet all Hard Silo Exclusionary Criteria.

CRITERION RATIONALE: Deployment Areas with larger suitable parcels on existing DoD/DoE installations will provide maximum flexibility in siting and avoid public interface concerns.

GOAL 2: Optimize System Operability

SUBGOAL 2.5: Maximize Quality of Life

OBJECTIVE 2.5.1: Provide Adequate Support Services

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.5.1.B.1: Preference was given to Main Operating Bases within 25 radial miles of a larger developed area (city, Census Designated Place, Urbanized Area).

CRITERION DEFINITION: A developed area is a support community that is of sufficient size and proximity to the Main Operating Base to provide typical services.

CRITERION RATIONALE: Basing within 25 miles of a support community enhances the likelihood that public and private sectors can respond to induced demands for goods, services, and facilities. Size of a support community is a surrogate measure of the community's ability to provide a full range of public services, merchandise, entertainment, and recreational activities for government employees.

GOAL 2: Optimize System Operability

SUBGOAL 2.5: Maximize Quality of Life

OBJECTIVE 2.5.1: Provide Adequate Support Services

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.5.1.B.2: Preference shall be given to Main Operating Bases with greater housing availability.

CRITERION DEFINITION: Housing is unaccompanied personnel quarters, military family housing, and off-base housing.

CRITERION RATIONALE: It is desirable to ensure that adequate and affordable housing is available on or near a Main Operating Base, thereby minimizing the need to construct new housing.

GOAL 3: Optimize System Practicability

SUBGOAL 3.2: Optimize Constructibility

OBJECTIVE 3.2.1: Minimize Deployment Area Construction Costs

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 3.2.1.B.1: Preference was given to Main Operating Bases with Deployment Areas in close proximity to adequate existing or new sources of high-quality concrete aggregates.

CRITERION DEFINITION: Adequate high-quality concrete aggregate resources was measured by the quantity and location of ledge rock (quarried and crushed bedrock) and valley-fill (sand and gravel) sources.

CRITERION RATIONALE: Availability of high-quality aggregates capable of producing high strength concrete is an important factor affecting the cost of system construction. It is preferable to use high-quality aggregates from existing or newly identified sources within a 30-mile haul distance from Deployment Areas, rather than transporting various quality aggregates from more distant areas.

GOAL 3: Optimize System Practicability

SUBGOAL 3.2: Optimize Constructibility

OBJECTIVE 3.2.1: Minimize Deployment Area Construction Costs

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 3.2.1.B.2: Preference shall be given to Main Operating Bases with less adverse terrain in the Deployment Areas.

CRITERION DEFINITION: Adverse terrain includes areas where local surface relief is characterized by:

- 1) Areas with drainages greater than 10 feet deep less than 1,000 feet apart.
- 2) Areas of rolling terrain defined by a preponderance of local relief with greater than 5 percent grade.
- 3) Areas of complex, highly variable terrain (including hummocky, dunal, and dissected terrains).

CRITERION RATIONALE: Adverse terrain requires extensive and costly modifications (earth moving) during construction to allow required vehicle/equipment access. Adverse terrain also reduces siting flexibility and impacts line of sight security measures.

GOAL 3: Optimize System Practicability

SUBGOAL 3.2: Optimize Constructibility

OBJECTIVE 3.2.1: Minimize Deployment Area Construction Costs

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 3.2.1.B.3: Preference was given to Main Operating Bases where sufficient water can be developed or obtained by appropriation or purchase/transfer for construction and operations in the Deployment Areas.

CRITERION DEFINITION: Sufficient water for construction and operation of the Hard Silo system is the quantity and quality of water available without the necessity to exercise condemnation.

CRITERION RATIONALE: Availability of water is an important factor affecting both system constructability and operability. It is preferable to develop unused water or purchase/transfer water from existing uses. It is desirable to avoid areas where present use is depleting local water supplies.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.1: Avoid High Value Land

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.1.B.1: Preference was given to Main Operating Bases with Deployment Areas which have fewer areas with significant energy and/or mineral resource interest.

CRITERION DEFINITION: Significant energy and/or mineral resource areas are areas of current commercial interest and potential future development as indicated by at least 20 percent energy/mineral lease/mining claim coverage over the Deployment Areas.

CRITERION RATIONALE: The presence of current energy and/or mineral leases and/or mining claims as well as actual mines raises the issue of value of the land. Areas of current interest, especially where proven or marginal reserves may be present, will have higher land values and may require additional time and mineral appraisal costs to acquire. Avoidance of such lands would avoid higher land values as well as the increased acquisition time and appraisal costs.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.1: Avoid High Value Land

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.1.B.2: Preference was given to Main Operating Bases with Deployment Areas which have less area in prime and unique farmland.

CRITERION DEFINITION: Prime farmland is land that has the best combination of physical and chemical characteristics for producing agricultural crops with minimum inputs of fuel, fertilizer, pesticides and labor as determined by the Secretary of Agriculture. Unique farmland is land other than prime farmland that is used for production of specific high-value crops.

CRITERION RATIONALE: The Farmland Protection Policy Act states the intent to "minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses ..."

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.1: Avoid High Value Land

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.1.B.3: Preference was given to Main Operating Bases with Deployment Areas which have less area in high yield timberlands.

CRITERION DEFINITION: High yield timberlands are forested lands currently maintained for commercial use of timber.

CRITERION RATIONALE: Minimizing deployment in high yield timberlands helps maintain the existing local economic base.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.1: Avoid High Value Land

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.1.B.4: Preference was given to Main Operating Bases with Deployment Areas which have less area currently identified in future land use development plans.

CRITERION DEFINITION: Conflicts with future land use development plans are areas of incompatability between Hard Silo land use and future development plans for the suitable area. Future land use development plans will indicate the direction, type, intensity, and pace of change and growth within the Deployment Area.

CRITERION RATIONALE: Siting conflicts with future land use areas will result in higher land values, less flexibility/expandability, and increased public interface.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.1: Avoid High Value Land

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.1.B.5: Preference was given to Main Operating Bases with Deployment Areas which have less area in agriculturally productive land.

CRITERION DEFINITION: Agricultural productivity is the quantity of agricultural development within the suitable area.

CRITERION RATIONALE: Deployment of the Hard Silo system is preferred in agriculturally unproductive areas in order to minimize the higher cost of land acquisition, and to minimize the need to remove economically valuable lands from production.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.2: Avoid High Value Economic Resources

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.2.B.1: Preference was given to Main Operating Bases with Deployment Areas which have less area within defined limits or boundaries of known energy resource areas.

CRITERION DEFINITION: Known energy resource areas are areas of fossil fuel, uranium, solar, wind, water, and geothermal sources which are currently identified for commercial use.

The following characteristics define known energy resource areas:

- a. Oil and/or gas fields with 2-10 million barrels proven oil reserves or greater than 10 billion cubic feet proven gas reserves;
- b. Coal mines producing more than 1 million tons per day (including deep mines);
- c. Geothermal fields (not contained in Known Geothermal Resource Areas);
- d. Major hydro-electric projects;
- e. Operating wind-powered generating projects;
- f. Operating solar-powered generating projects;
- g. Producing uranium mines.

CRITERION RATIONALE: The Air Force desires to avoid land use conflicts or competition with development or production of valuable energy resources, the loss of which may have an impact upon the national economy, national security, or the local economy.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.2: Avoid High Value Economic Resources

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.2.B.2: Preference was given to Main Operating Bases with Deployment Areas which have less area within the boundaries of high value mineral resource areas.

CRITERION DEFINITION: High value mineral resources are metallic and non-metallic minerals (excluding fossil fuels and uranium) which are currently developed or have proven economic or marginal reserves.

The following characteristics define high value mineral resources:

- a. Properties containing greater than 10 percent of United States reserves of any mineral on the Strategic Minerals List identified by the Federal Emergency Management Agency.
- b. Producing mines with at least 100 employees.
- c. Operating mines that produce 10 percent or more of the United States output of the commodity.

CRITERION RATIONALE: The Air Force desires to avoid land use conflicts or competition with development of valuable mineral resources, the loss of which may have an impact upon the national economy, national security, or would significantly disrupt the local economy.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.3: Minimize Land Acquisition

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.3.B.1: Consider land ownership in evaluating potential deployment alternatives.

CRITERION DEFINITION: Land ownership is the owner/manager of the land in the Deployment Area.

CRITERION RATIONALE: The order of preference for land ownership in the Deployment Areas is DoD fee, DoD withdrawn lands, leased lands, private lands, Federal lands (Public), and State lands (Public).

The rationale for ordering the land ownership categories arises from consideration of different time duration and costs required to acquire the land with these ownership types. It also addresses the desire to minimize impact to the owners and users of the lands by minimizing displacement or loss of economically valuable land. DoD fee poses the least constraints to time, cost and public impact. Public land entails the longest time of acquisition, can involve many people that have the potential of being adversely impacted, and poses the greatest risk to schedule.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.3: Minimize Land Acquisition

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.3.B.2: Preference was given to Main Operating Bases that have Deployment Areas within 50 miles that are on existing DoD/DoE installations.

CRITERION DEFINITION: On-installation Deployment Areas are those suitable parcels located on DoD/DoE installations within 50 miles of the Main Operating Base, which meet all Hard Silo Exclusionary Criteria.

CRITERION RATIONALE: Deployment Areas that are on existing DoD/DoE installations avoid potentially productive or economically valuable lands and minimizes public interface.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.3: Minimize Land Acquisition

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.3.B.3: Preference was given to Main Operating Bases that are contiguous to existing DoD/DoE installations with suitable area.

CRITERION DEFINITION: Contiguous DoD/DoE installations either contain, or are adjacent to, the Main Operating Base and have suitable area which meets all Hard Silo Exclusionary Criteria.

CRITERION RATIONALE: Deployment Areas that are on existing DoD/DoE installations that are contiguous to the Main Operating Base minimize the need for transporting equipment and personnel over public lands.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.4: Minimize Infrastructure Impact

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.4.B.1: Preference was given to Main Operating Bases with Deployment Areas which are not dissected by major highways, utility lines, and highway/utility corridors.

CRITERION DEFINITION: Major highways include interstate and state highways and may include major county arterials that are important to local transportation. Utility lines to be considered include electrical transmission lines, oil and gas pipelines, and may include primary water or sewer lines. Transportation corridors are areas contiguous to existing highways or acquired for planned new highways. Utility corridors are those areas currently owned or under acquisition by utility departments or companies and are under active design or construction.

CRITERION RATIONALE: It is desirable to avoid the costs and delays associated with relocation of major transportation and utility arterials.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.5: Minimize Impacts on Resource Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.5.B.1: Preference was given to Main Operating Bases where water is available to meet the needs of the existing population and the additional project requirements.

CRITERION DEFINITION: An area will be deemed to have sufficient water when water resources and the water system can be developed to meet the needs of both the support community and Main Operating Base.

CRITERION RATIONALE: Availability of water affects both system constructability and operability. It is preferable to develop unused water or purchase/transfer water from existing uses. It is desirable to avoid areas where present use is depleting local water supplies and where additional demands on the Main Operating Base and the support communities' water-supply systems will seriously stress the systems.

GOAL 4: Minimize Public Impact

SUBGOAL 4.2: Maximize Public Safety/Security

OBJECTIVE 4.2.2: Avoid Natural Hazards

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.2.2.B.1: Preference was given to Main Operating Bases with Deployment Areas which have less area within 100-year floodplains.

CRITERION DEFINITION: 100-year floodplains are the lowland and relatively flat areas adjoining inland and coastal waters and areas adjoining drainages that are subject to a one percent or greater chance of flooding in any given year, as defined and identified by the Federal Emergency Management Agency.

CRITERION RATIONALE: Executive Order 11988 directs all federal agencies to consider the consequences of proposed actions within floodplains, and to carry out such actions only upon a specific finding that there is no practical alternative to siting within a floodplain.

GOAL 4: Minimize Public Impact

SUBGOAL 4.2: Maximize Public Safety/Security

OBJECTIVE 4.2.3: Avoid Safety Conflicts

LEVEL OF APPLICATION: 3 - Area Evaluative

CRITERION STATEMENT 4.2.3.B.1: Preference was given to Main Operating Bases where the interface between the Hard Silo system and the resident population in the Deployment Area is minimal.

CRITERION DEFINITION: Population interface is the density of inhabited structures in the Deployment Area.

CRITERION RATIONALE: Minimum population interface serves to enhance public safety by avoiding urbanized and developed areas. Inhabited structures indicate the relative density and distribution of populated areas in the Deployment Area.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.1: Preference was given to Main Operating Bases in areas of large nonrural populations.

CRITERION DEFINITION: Nonrural population is population in urbanized areas, in cities, and in census-designated places outside urbanized areas in all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: Large population centers reduce the need to provide new public services and facilities and are best able to minimize social disruption of host residents.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.2: Preference was given to Main Operating Bases in areas that have available labor.

CRITERION DEFINITION: Available labor is measured within all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: A constrained labor supply may limit opportunities for satisfying direct and indirect labor demand locally and thereby increase the likelihood of induced immigration. This is especially true of the critical induced demand for construction labor, which can lead to rapid fluctuations in population. Low rates might drive up the cost of labor and create sector-specific labor shortages as more job switching occurs. Areas of high unemployment may afford the greatest productivity benefits.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.3: Preference was given to Main Operating Bases in areas with a diverse economic base.

CRITERION DEFINITION: Economic diversity is measured by the relative concentrations of export-producing industries at the two-digit Standard Industrial Classification level in all counties either wholly or partially within 50 miles of the Main Operating Base.

CRITERION RATIONALE: Induced immigration may be minimized if many export-producing industry types are represented locally and have the capacity to respond to project-related purchases.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.4: Preference was given to Main Operating Bases in areas with subgroup populations similar to those induced by project construction and operation.

CRITERION DEFINITION: Population similarity was measured in terms of the sum of military and construction employment in all counties either partially or wholly within 50 miles of a Main Operating Base.

CRITERION RATIONALE: The extent to which the resident population matches the induced immigrating population in terms of the demographic characteristics defined above determines, in large part, the degree to which residents notice change. It is assumed that assimilation of induced population could best occur in a host area containing populations with similar characteristics.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.2: Minimize Adverse Impacts on Public Finance

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.2.B.3: Preference was given to Main Operating Bases where areas of potential socioeconomic influence contain jurisdictions that exhibit an adequate taxing effort.

CRITERION DEFINITION: Taxing effort is an indicator of the ability of local residents to capture tax revenue in the short run to satisfy potential expenditure demands and is measured by the quotient of total own-source revenues over total local income in all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: Rapid growth often generates the need for increased capital and operating expenditures. Public entities that are constrained in their ability to raise tax revenues in the short term due to political or legal limitations may face significant fiscal problems. Areas with a relatively high tax effort are able to capture more benefits (revenues) from the project.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.3: Minimize Impacts on Community Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.3.B.1: Preference was given to Main Operating Bases in areas with larger supplies of available housing.

CRITERION DEFINITION: Available housing supply is defined as the number of vacant dwelling units in all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: Areas with an adequate housing supply can accommodate immigration more readily by reducing the need for additional housing and related public services.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.1: Minimize Impacts to Natural Environment

OBJECTIVE 5.1.2: Minimize Pollution Effects

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 5.1.2.B.1: Preference was given to Main Operating Bases and Deployment Areas which are in attainment for regulated pollutants and have less area near or within Prevention of Significant Deterioration Class I areas.

CRITERION DEFINITION: Air quality is defined as the condition of the atmosphere, expressed by concentrations of various "air pollutants," occurring in an area as a result of emissions from either natural or man-made sources. An "air pollutant" is defined as any chemical species or form of particulate matter which causes degradation in one of the three major categories required for good air quality, i.e., human health, human welfare, and visibility.

CRITERION RATIONALE: Air quality affects the public health and welfare, and the aesthetic quality of a given area, and is regulated by federal and state ambient air quality standards. It is preferable to site Main Operating Bases and their Deployment Areas in locations that are not designated as either Class I attainment areas or nonattainment areas.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.2: Minimize Cultural Resources Impacts

OBJECTIVE 5.2.1: Minimize Impacts to Historic Resources

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 5.2.1.B.1: Preference was given to Main Operating Bases where no known significant cultural resources exist or where no adverse effects are expected to occur to known significant cultural resources due to project construction and operation in the Deployment Area or on the Main Operating Base.

CRITERION DEFINITION: Significant cultural resources are those properties listed on or eligible for listing on the National Register of Historic Places.

CRITERION RATIONALE: Significant cultural resources encompass heritage, educational and research values important to American society. Cultural resources are evaluated in terms of the criteria for inclusion on the National Register as defined in 36 CFR 60.6. National Register criteria are used to identify properties with quality of significance in American history, architecture, archaeology and culture as represented by districts, sites, buildings, structures, and objects, and possessing integrity of location, design and association.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

OBJECTIVE 5.3.2: Minimum Disturbance to Special Use Areas

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 5.3.2.B.1: Preference was given to Main Operating Bases with Deployment Areas that have less area within the boundaries of Wilderness Study Areas and Roadless Area Review and Evaluation (RARE) II area.

CRITERION DEFINITION: Wilderness Study Areas/RARE II areas are federally owned land "untrammeled" by man, nominated by the Secretary of the Interior and are under consideration for designation as Wilderness Areas.

CRITERION RATIONALE: For Wilderness Study Areas/RARE II areas, statutes restrict the usage of the land in order to preserve the land's special characteristics. These restraints may preclude siting the Small ICBM in Wilderness Study Areas/RARE II areas without specific congressional action.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

OBJECTIVE 5.3.2: Minimum Disturbance to Special Use Areas

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 5.3.2.B.2: Preference was given to Main Operating Bases with Deployment Areas that have less area within the boundaries of experimental ranges/farms.

CRITERION DEFINITION: Experimental ranges/farms are areas set aside and administered by the U.S. Department of Agriculture for specialized testing, usually of agricultural crops and/or treatment products (pesticides, fertilizers).

CRITERION RATIONALE: Acquisition of land within experimental ranges/farms could entail a lengthy procedure due to the unique characteristics of the activities performed within their boundaries.

GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

OBJECTIVE 5.3.2: Minimum Disturbance to Special Use Areas

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 5.3.2.B.3: Preference was given to Main Operating Bases with Deployment Areas that have less area within the boundaries of national and state forests.

CRITERION DEFINITION: National forests are "public land, wholly or in part covered with timber or undergrowth, whether of commercial value or not," that have been set aside by Presidential proclamation. These are managed by the U.S. Forest Service under the Department of Agriculture. State forests are defined under state law and managed by state agencies.

CRITERION RATIONALE: National forests are established for the purpose of improving and protecting the forests, securing favorable conditions of water flow and to furnish a continuous supply of timber (16 USC 475). Multiple use of forest lands is expressly encouraged so long as it does not "preclude the general public from full enjoyment of the natural scenic, recreational and other aspects of the national forest" (16 USC 497). The recently enacted Forest and Rangeland Renewable Resources Planning Act (16 USC 1600 et seq.) requires the preparation of plans for the management of U.S. Forest Service property. These plans are subject to public review prior to being submitted by the Secretary of Agriculture to the President. Uses that are inconsistent with such plans would require time-consuming revision of the plans and should be avoided.

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APPENDIX D

HARD SILO IN PATTERNED ARRAY

BASING MODE

MAIN OPERATING BASE AND

DEPLOYMENT AREA EVALUATION

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SENSITIVE

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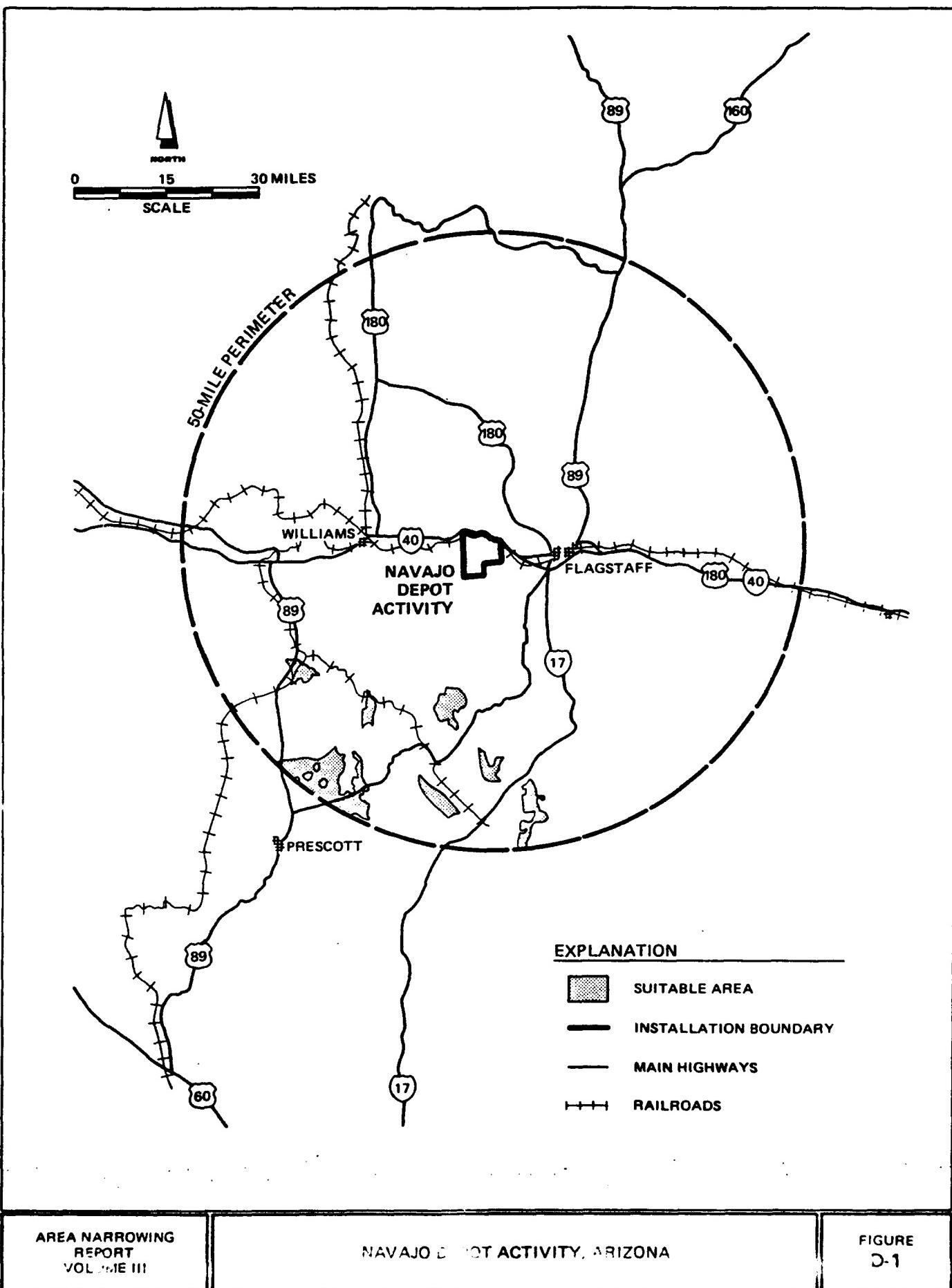
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D-1 Arizona - North-Central Complex

Following application of the Exclusionary Criteria, Navajo Depot Activity was identified as a complex based on its solitary geographic location in north-central Arizona (Figure D-1).

Application of the Evaluative Criteria to the 14 complexes resulted in the elimination of Navajo Depot Activity and its potential Deployment Area. The major factors in this determination were the small deployment areas and their distance from the base, general lack of land on base for facilities expansion, and limited support services available in the immediate vicinity.

The following section elaborates on the performance of the potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

D-1.1 Navajo Depot Activity, Arizona

After evaluating the alternatives among the complexes in relation to each other, Navajo Depot Activity (DA) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the small deployment areas and their distances from the base. Also contributing were the lack of land available on base for facility expansion and the limited support services available in the immediate vicinity.

Navajo DA is located in north-central Arizona, approximately 10 miles west of the city of Flagstaff (Figure D-1). The Depot is under the command of the Army through Tooele Army Depot and is used as a storage area for military munitions. Navajo DA is also used as a training area for Arizona National Guard personnel.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Navajo DA provide limited options for siting the Hard Silo system. The potential Deployment Area consists of seven suitable area parcels, which total 156 square miles. The parcels range in size from 8 to 75 square miles.

Security concerns within the potential Deployment Area would be minimal due to the low density of inhabited

structures. Transportation and utility corridors affect portions of the Deployment Area and cause additional security concerns.

System Operability: The efficiency of Main Operating Base operations would be enhanced by the short distance (14 miles) to the support community of Flagstaff. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base.

Distances to the suitable area parcels from the base range from 49 to 93 road miles; the average distance is 68 road miles. These distances could hamper maintenance operations.

Virtually no suitable land is available at Navajo DA for new facilities or for Weapons Storage Area/Stage Storage Area facilities. The base is not anticipating a mission change that would increase the availability of existing facilities for the Hard Silo mission.

Presently, 100 percent of the land at Navajo DA is DoD fee-owned and land withdrawn for military use.

The utility infrastructure at Navajo DA is adequate for present base operations, with a potential for expansion to meet future demands. Electrical power is presently supplied by Arizona Public Service, and the system has

excess capacity. Heating at Navajo DA is provided by both natural gas and fuel oil; supplies of these fuels are adequate to meet present and future demands.

Waste-water treatment facilities on base are adequate to meet present demand but may require expansion to accommodate future demands. Solid waste is collected and disposed of by the city of Flagstaff in the Flagstaff landfill. The existing landfill capacity is more than adequate to meet future needs. The base storm drainage system is an extensive network of ditches, culverts, and bridges. This system is adequate to handle storm runoff that occurs on the base. It is likely that sufficient ground water is available through direct development to support new facilities for the Hard Silo mission; however, significant expansion of the existing water-supply facilities would be required. Ground water would require only conventional treatment prior to domestic use. Surface water is committed to the Salt River Project and may not be available for use in the area.

The Navajo DA transportation system is limited by a lack of airfield facilities on base. The nearest air facility is a public airport, located approximately 4 miles south of Flagstaff, that has a 7,000-foot, instrumented runway. Railroad access to the base is provided by a spur from the Sante Fe line that leads

directly into the northern boundary of the base. Highway access to the base is provided by Interstate Highway 40, which runs along the northern boundary of the base.

Navajo DA is an Army installation controlled by Tooele Army Depot. The existing logistic and personnel support services would need to be augmented to be compatible with the Hard Silo mission.

The support services for Navajo DA are adequate, as indicated by the availability of housing and the proximity to a support community. There is available housing in the vicinity of Navajo DA. On-base housing is presently inadequate for the existing mission needs; however, there is room for contiguous housing expansion or infilling. Off-base housing is available but rents and prices in nearby Flagstaff are subject to seasonal fluctuations. The city of Flagstaff (population of about 35,000) is the nearest community capable of providing a full range of goods and services.

System Practicability: Construction aggregate is available to support system construction through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints and could increase

construction and security surveillance costs.

Twenty-three percent of the potential Deployment Area contains adverse terrain. It is likely that sufficient ground water for system construction and operation will be available through direct development. Ground water in the potential Deployment Area is of poor quality in local areas and may require more than conventional treatment prior to construction use. Surface water in the Deployment Area is committed to the Salt River Project and may not be available for use in the area.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the potential Deployment Area is minimal. Less than 1 percent of the potential Deployment Area contains agricultural land. No prime and unique farmland or timberland occurs in the potential Deployment Area. Future land-use development plans are not expected to affect the Deployment Area. Presently, 19 percent of the townships in the potential Deployment Area have 20 percent or greater claim/lease coverage for energy and mineral resources, with the coverage concentrated in about half the parcels. None of the townships have known energy or high value mineral resource areas.

There is no suitable area on Navajo DA. There is also no suitable area on DoD installations within 50 miles

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of Navajo DA. The majority of the potential Deployment Area occurs on federally administered (USDA) land, with the remaining area being privately owned land and state land.

Transportation and utility corridors affect approximately 30 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. A limited impact on water availability in the support community of Flagstaff is likely to occur due to the increase in population from project workers and their dependents. Although significant expansion of the existing water supply system would be required, it is expected that adequate supplies of ground water could be developed to meet the additional needs. The ground water will require conventional treatment prior to use. Surface water may not be available for use in the support community because it is committed to the Salt River Project.

Natural hazards in the potential Deployment Area are considered minimal. Small portions of most parcels are located within identified 100-year floodplains, but affect only 4 percent of the potential Deployment Area. Public safety concerns within the Deployment Area should be minimal due to the very small areas of isolated or low density inhabited structures.

Deployment of the Hard Silo system could raise social and economic concerns in the Flagstaff area. The region of influence surrounding the base has a relatively small population, indicating a limited range of goods and services, but the nearby city of Flagstaff can provide a reasonable range of goods and services to support system construction and operation.

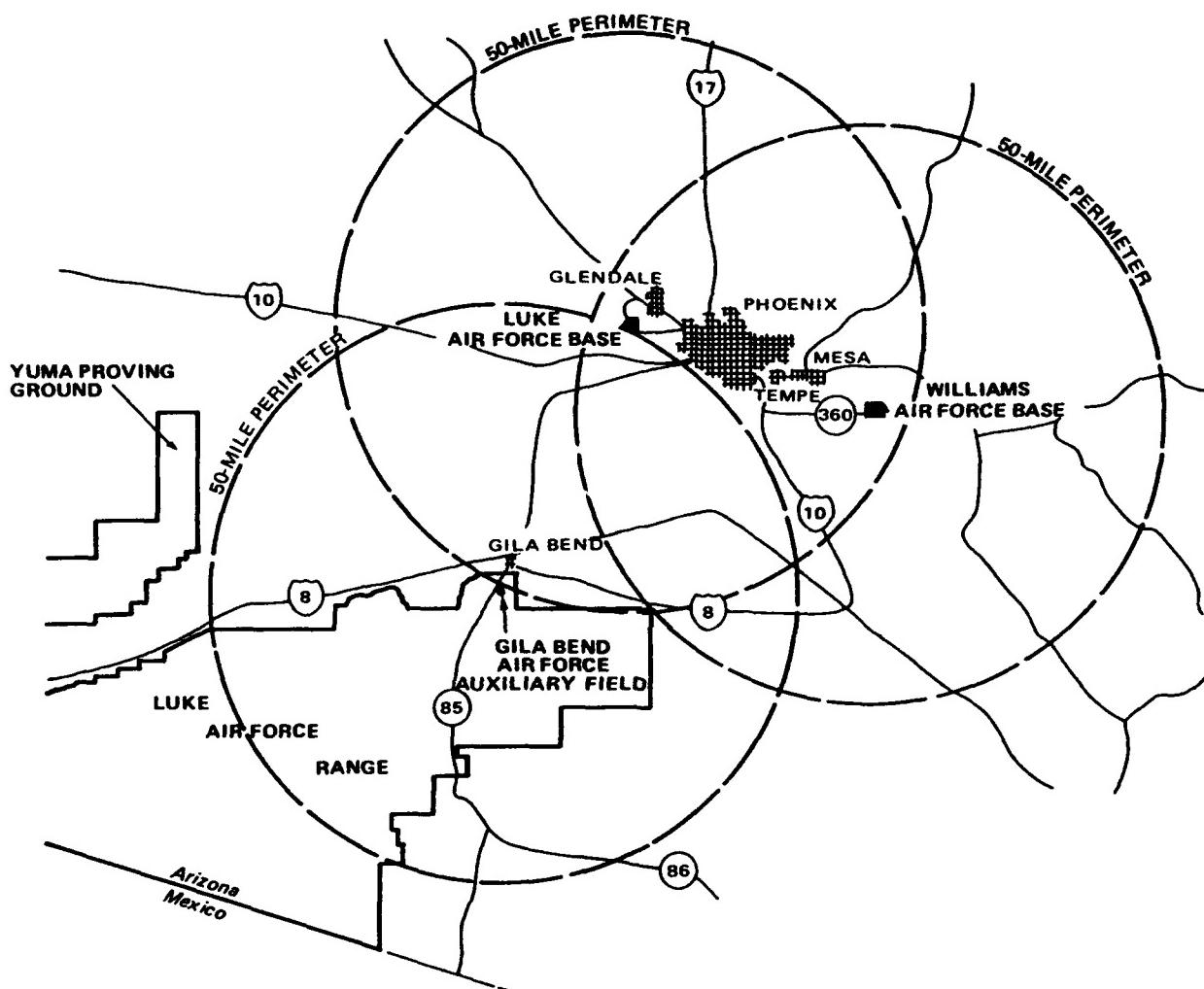
Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is relatively low, which means that new workers will most likely have backgrounds dissimilar to those of the resident population. Based on the number of export-producing industries in the region, the economic diversity of the region is limited. Local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the region is relatively limited. Some other comparative regional disadvantages can be offset in part by the proximity of Flagstaff.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. No cultural resource

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sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based on the cultural history of the region, these types of cultural resource sites may be discovered if a detailed field survey were performed. None of the potential Deployment Area contains Wilderness Study Areas, RARE II areas, or experimental ranges/farms. Approximately 53 percent of the potential Deployment Area is on National/State forest land. The forest lands cover from 94 to 100 percent of each parcel, with the exception of one parcel that contains less than 5 percent forest land.

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EXPLANATION

— INSTALLATION BOUNDARY

— MAIN HIGHWAYS

0 15 30 MILES
SCALE

AREA NARROWING
REPORT
VOLUME III

ARIZONA - SOUTH-CENTRAL COMPLEX

FIGURE
D-2

D-2 Arizona - South-Central Complex

Following application of the Exclusionary Criteria, Gila Bend Air Force Auxiliary Field, Luke Air Force Base, and Williams Air Force Base were grouped into a complex (Figure D-2).

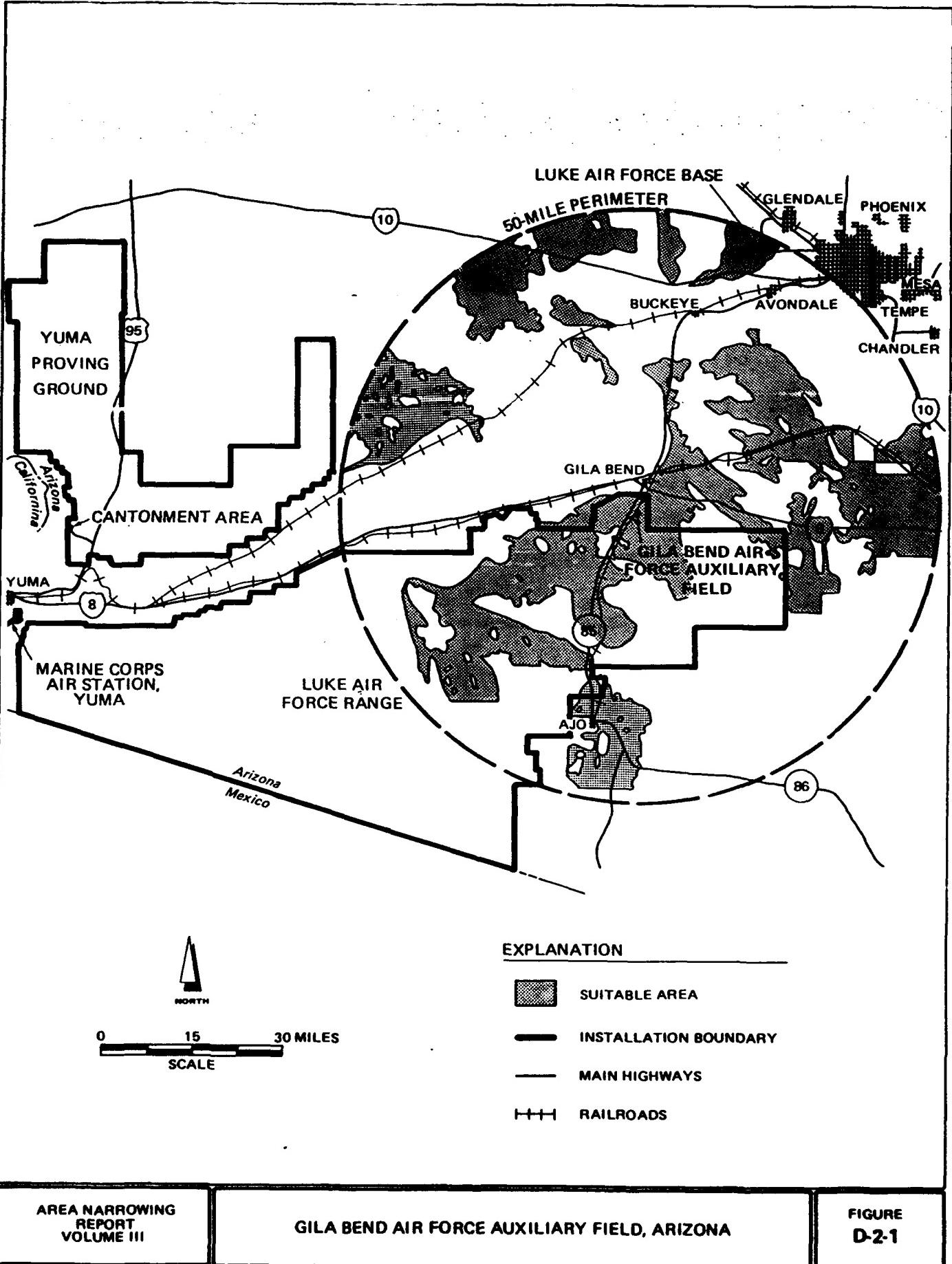
Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of all bases except Gila Bend AFAF. In addition, Gila Bend AFAF and its potential Deployment Area remained after application of the Evaluative Criteria to the 14 complexes. No determination has been made at this time regarding the overall advisability of using this Tactical Air Command installation to support a Strategic Air Command mission.

The major factors in eliminating Luke AFB and Williams AFB were:

Luke Air Force Base - general lack of land on base for facilities expansion, and potential deployment areas are dissected by transportation and utility corridors.

Williams Air Force Base - little land available on base for facilities expansion without excessive mitigation for cultural finds, and potential deployment areas dissected by transportation and utility corridors.

The following sections elaborate on the performance of each potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.



D-2.1 Gila Bend Air Force Auxiliary Field, Arizona

After evaluating the alternatives among the complexes in relation to each other, Gila Bend Air Force Auxiliary Field (AFAF) remains for more detailed study. The potential Main Operating Base/Deployment Area has favorable characteristics for Hard Silo deployment. The base is contiguous with Luke Air Force Range, has abundant land for on-base facilities development, and large suitable area parcels both off-base and on DoD land.

Gila Bend AFAF is located in southwestern Arizona, approximately 4 miles south of Gila Bend (Figure D-2-1). Phoenix, the largest population center in Arizona, is approximately 58 miles to the northeast. The base is operated by the Air Force Tactical Air Command and serves as a support airfield to Luke Air Force Base for on-range activities.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Gila Bend AFAF provide many options for siting the Hard Silo system. The potential Deployment Area consists of eight suitable area parcels that contain a total of 2,435 square miles. Six of these parcels range in size from 17 to 243 square miles, with the other two parcels containing 629 and 1,063 square miles. Approximately

60 percent of the largest parcel is located within the boundaries of Luke Air Force Range, adjacent to Gila Bend AFAF. This same area alone constitutes approximately 25 percent of the potential Deployment Area.

Security concerns within the potential Deployment Area would be minimal because of the overall low density of inhabited structures; however, three parcels located west of and south of the Phoenix area pose potential security concerns. Within these parcels, 40 to 65 percent of the area contains a low density of inhabited structures. The presence of these structures pose siting and security concerns greater than those found in the remaining 5 parcels. Transportation and utility corridors affect portions of the Deployment Area and cause additional security concerns.

System Operability: The operational efficiency of Gila Bend AFAF as a Main Operating Base would be degraded by the lack of a nearby support community that could provide a wide range of goods and services. Gila Bend, the nearest community, has a small population and minimal support services. The nearest support community is Phoenix, approximately 58 road miles to the northeast.

The accessibility to base maintenance facilities from The potential Deployment Area is dependent upon the

final parcel(s) selected for siting and its distance from the base. Distances to parcels from the base range from 34 to 73 road miles and average 54 road miles. These distances could hamper maintenance operations.

Gila Bend AFAF has sufficient land for siting new Hard Silo support facilities. Gila Bend AFAF is surrounded by the Luke Air Force Range, offering many opportunities for expansion. The base does not expect a mission loss that would make some of its existing facilities available for the Hard Silo system. All of the land on-base is land withdrawn for military use.

The utility infrastructure supporting the base appears adequate for present use, but would require considerable expansion and development to accommodate Hard Silo deployment. Additional electrical power capacity is believed to be available from the nearby Arizona Public Service transmission lines to the towns of Gila Bend and Ajo. Heat is currently provided by #2 diesel fuel which is stored in an above-ground tank. There are no petroleum pipelines, gas pipelines, or distribution facilities in close proximity to the base. Waste-water treatment for the base is provided by three on-base lagoons. Their one million gallon-per-day capacity is adequate to meet current demands.

Solid waste disposal facilities are capable of meeting future needs with minimal changes. The base storm water system drainage consists of berm/channel structures, which are adequate to divert storm runoff. There are no reliable surface-water supplies available in the area. There is a potential for further development of ground-water sources in the area, but poor water quality would limit its availability for domestic use without treatment. The reverse osmosis water treatment facility that provides potable water to the base is sufficient to meet current demands, but would likely require considerable expansion to meet the needs of the Hard Silo system.

Gila Bend AFAF has a good transportation system. The base has an uninstrumented, 8,500-foot runway, which provides emergency support for fighter aircraft operating over Luke Air Force Range. Access from the base to Interstate Highway 8, located 4 miles north of the base, is provided by State Highway 85. Rail service is provided by the Tucson-Cornelia and the Gila Bend Railroad. A spur along the west side of the base is used as a storage area for tanker cars.

Because Gila Bend AFAF is an Air Force installation, its logistical and personnel support capabilities are compatible with the Hard Silo mission. Luke AFB

provides most of Gila Bend AFAF's personnel and logistic support needs.

Gila Bend AFAF has limited community support services as indicated by the distance to Phoenix (58 miles), the nearest community with a wide range of goods, services, and facilities. Gila Bend (population approximately 1,600) is the largest community within 25 radial miles of the base; its support services are very limited.

Off-base housing in Gila Bend is limited. On-base housing is at maximum occupancy.

System Practicability: Construction aggregate is available through direct development and/or purchase. Aggregate sources are distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints, and can increase construction and security surveillance costs. Two percent of the proposed Deployment Area contains adverse terrain. It is likely that ground water can be purchased and/or developed in the potential Deployment Area to support deployment of the Hard Silo system. Extensive use of ground water would continue to overdraft some ground-water basins. Ground water may be of poor quality over much of the area and may require conventional treatment prior to some construction uses.

Public Impacts: Potential land-use conflicts from deployment of the Hard Silo system within the potential Deployment Area at Gila Bend are low. All but one parcel of the Deployment Area contain agricultural land, affecting 11 percent of the area; none of the potential Deployment Area is classified as prime and unique farmland. Future land-use development plans and trends are not expected to adversely affect the Deployment Area. None of the potential Deployment Area contains timberlands. Presently, 47 percent of the townships in the potential Deployment Area have 20 percent or more area under energy or mineral claim/lease. However, known energy resource areas are present in 1 percent of the townships and high-value mineral resource areas are present in three percent of these townships.

A total of 654 square miles of DoD land or 27 percent of the Deployment Area, is within the potential Gila Bend AFAF Deployment Area. This large amount of area provides a high potential for on-installation deployment. The remaining Deployment Area is predominantly located on federally administered (BLM) land, with some area on private and state land.

Transportation and utility corridors have a minimal effect on siting the Hard Silo system. Transportation

and utility corridors affect approximately 19 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system.

Water concerns raised for the Deployment Area and the base also apply to the support community. Ground water could likely be developed, but considerable expansion of existing supply and treatment systems in the community of Gila Bend would be required. This could limit the community's ability to support the immigration of workers. As with other economic effects, this would likely be reduced because it is reasonable to assume that a percentage of base personnel, workers, and their dependents would choose to live in the Phoenix urban area, which has ample resources to absorb Hard Silo induced economic demands.

Natural hazards in the potential Deployment Area are considered minimal. Only 1 percent of the Deployment Area is located within identified 100-year floodplains. Generally, the sparse distribution of inhabited structures in the potential Deployment Area should reduce the level of public safety concerns.

Social effects arising from Hard Silo deployment in this area could be high if the town of Gila Bend absorbs even a small portion of the Hard Silo system

induced population. The urban centers of the region including Phoenix, however, should absorb most of the population influx. The region is diverse enough to provide a wide range of goods and services.

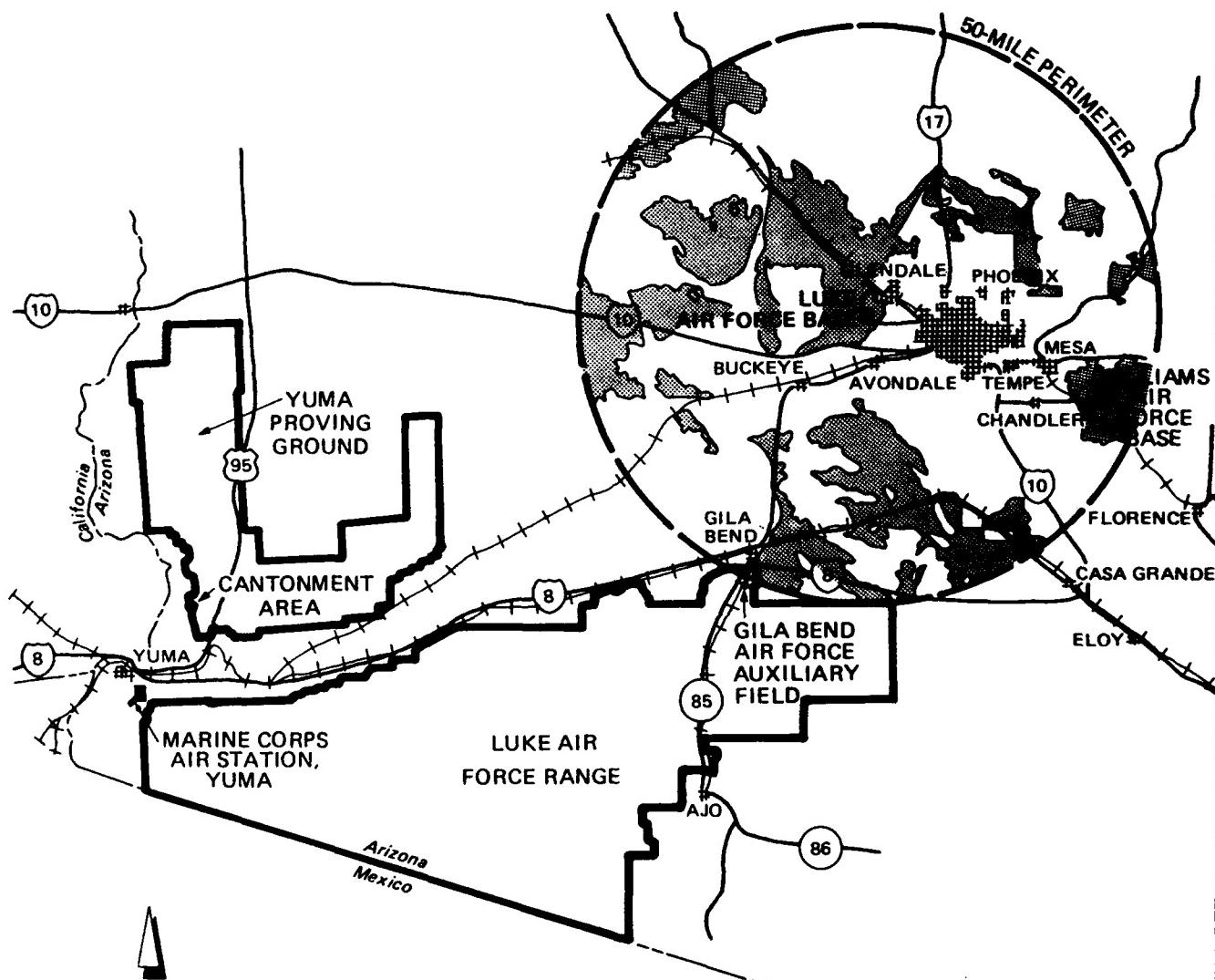
Nonagricultural employment in the region is sufficiently high to avoid the consequences of project-related immigration. Regional employment in the construction and military sectors is also high, which suggests that new project-related workers are likely to have backgrounds similar to those of the resident population. The economic diversity of the region is relatively high as indicated by the number of export-producing industries. The local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. Although Gila Bend can provide only very limited housing, the Phoenix area contains considerable amounts of available housing.

Environmental Impacts: The potential Deployment area is in attainment for all major air pollutants, with the exception of one parcel located near Luke AFR, which is in non-attainment for two pollutants. Activities within the Deployment Area would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within the

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Deployment Area. Discovery of additional sites is likely if a detailed field survey were performed. A significant portion of the Deployment Area lies adjacent to the Gila River and other areas known to be important Native American sites and wildlife migration routes. Wilderness Study Areas and RARE II areas occur in five parcels which affects 4 percent of the potential Deployment Area. The Deployment Area does not contain experimental ranges/farms or National/State forest lands.

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EXPLANATION

- [Hatched square] SUITABLE AREA
- [Solid line] INSTALLATION BOUNDARY
- [Dashed line] MAIN HIGHWAYS
- [Dotted line] RAILROADS

AREA NARROWING
REPORT
VOLUME III

LUKE AIR FORCE BASE, ARIZONA

FIGURE
D-2-2

D-2.2 Luke Air Force Base, Arizona

After evaluating the alternatives within the complex in relation to each other, Luke Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were that potential deployment areas are dissected by transportation and utility corridors and there is limited land available on base for facility expansion.

Luke AFB is located in south-central Arizona, approximately 8 miles northwest of Phoenix, the largest population center in Arizona (Figure D-2-2). The base presently supports an Air Force Tactical Air Command training mission.

System Effectiveness: The size and distribution of the suitable area parcels within 50 radial miles of Luke AFB would provide numerous options for siting the Hard Silo system. The potential Deployment Area encompasses 2,171 square miles distributed among 11 suitable area parcels. These parcels range in size from 17 to 595 square miles. The suitable area parcels are evenly distributed around the base, with the largest parcel being contiguous to the base.

Security concerns within the potential Deployment Area would be minimal due to the overall density of

inhabited structures; however, the three largest parcels pose potential security concerns. Within these three parcels, 30 to 55 percent of the suitable area contains a low density of inhabited structures. The presence of these structures pose siting and security concerns greater than those found in the remaining 8 parcels. Transportation and utility corridors affect portions of the proposed Deployment Area, causing additional security concerns.

System Operability: The operational efficiency of Luke AFB as a Main Operating Base would be enhanced by the proximity of Glendale (4 miles), the nearest community that can supply a wide range of goods and services. Accessibility to base maintenance facilities from the potential Deployment Area is dependent on the final parcel(s) selected for siting and its distance from the Main Operating Base. Although there are parcels contiguous to the base, the average distance from the base to the suitable area parcels is 60 road miles, a distance that could hamper maintenance operations.

Luke AFB has limited land for expansion. Land to support new facilities for the Hard Silo mission, including Weapons Storage Area/Stage Storage Area facilities, is constrained by existing missions. Off-base expansion is highly constrained by urban

development trends. The base is not anticipating a reduction in operations that would increase the availability of existing facilities for the Hard Silo mission. The on-base land is 100 percent DoD fee-owned.

The utility infrastructure at Luke AFB appears adequate for present base operations, and the proximity to Phoenix provides the potential for expanding the capacity. Electrical power is provided by Arizona Public Service. Natural gas is used for heating and is provided by the Southwest Gas Company. The base operates its own waste-water treatment facilities; additional expansion is planned for 1987 by connecting to Glendale city facilities. Solid waste is collected by a private contractor and is deposited in a leased landfill that is potentially expandable to an unused 33-acre site. Base storm drainage system facilities are adequate to handle runoff conditions. Surface water may be available to meet Hard Silo system requirements when the Central Arizona Project is completed in 1986. Additional water could be made available through purchase/transfer of existing agricultural water rights; however, overdrafting of ground-water basins would continue. Water may be of poor quality locally and require more than conventional treatment prior to domestic use.

Luke AFB has access to a complete transportation network. The base has two parallel, fully instrumented runways, one 12,000 feet long and the other 10,000 feet long. Interstate Highways 10 and 17 are located 6 and 15 miles south and east of the base, respectively, and are accessible by four-lane county roads. Rail service enters the base from the north and continues into the bulk fuel tank farm.

Because Luke AFB is an Air Force installation, the logistic and personnel support systems would be compatible with the Hard Silo mission.

The support services for Luke AFB are generally good, although housing availability is limited. The base is close to Glendale and the Phoenix area which provide a wide range of goods, services, and facilities. The availability of off-base housing is adequate, but units for lower income families are scarce. The base housing, which has an occupancy rate of 99 percent, cannot meet existing mission requirements.

System Practicability: Construction quality aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain conditions, which affect 13 percent of the potential Deployment Area, may impose some system siting constraints. It is

likely that sufficient water will be available in the potential Deployment Area for system construction and operation. Water from the Central Arizona Project and purchase/transfer of existing ground-water rights are likely to provide sufficient requirements. Extensive use of the ground-water would continue to over draft the basins. Ground water may be of poor quality over much of the area and may require more than conventional treatment prior to use.

Public Impacts: Potential land-use conflicts from deployment of the Hard Silo system within the potential Luke AFB Deployment Area are low. Agricultural land is present in 16 percent of the potential Deployment Area; none of the potential Deployment Area is classified as prime and unique farmland. There is no timberland in the potential Deployment Area. Approximately 52 percent of the townships within the potential Deployment Area currently have 20 percent or greater area under energy or mineral claim/lease. However, high value minerals and known energy resource areas do not occur in these townships. Future land use development plans and trends are not expected to adversely affect the proposed use of the Deployment Area.

The 23 square miles of on-base suitable area within 50 miles of Luke AFB provide few options for system

deployment. In addition, much of this suitable area has been developed. The majority of the potential Deployment Area is federally administered (BLM) and privately owned land, with only 1 percent DoD land.

Transportation and utility corridors affect approximately 29 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo mission. The potential water demand on the support community of an induced work force and their families from deployment of the Hard Silo mission is expected to be minimal because of the potential availability of Central Arizona Project water as well as possible purchase/transfer of ground-water rights.

Natural hazards in the potential Deployment Area are considered minimal. Only three percent of the Deployment Area is located within known 100-year floodplains. The general lack of inhabited structures in parcels will minimize public safety concerns within the potential Deployment Area.

The three-county region of influence surrounding Luke AFB has a large population, and should be able to provide a wide range of goods and services. Nonagricultural employment is higher than average and reduces the likelihood of immigration of project-related workers. Regional employment in the

construction and military sectors is also high, which means that new workers will likely have backgrounds similar to those of the resident population. The economic diversity of the region is high, as indicated by the number of export-producing industries in the area. Local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. The region contains many available housing units and the support community can provide ample housing.

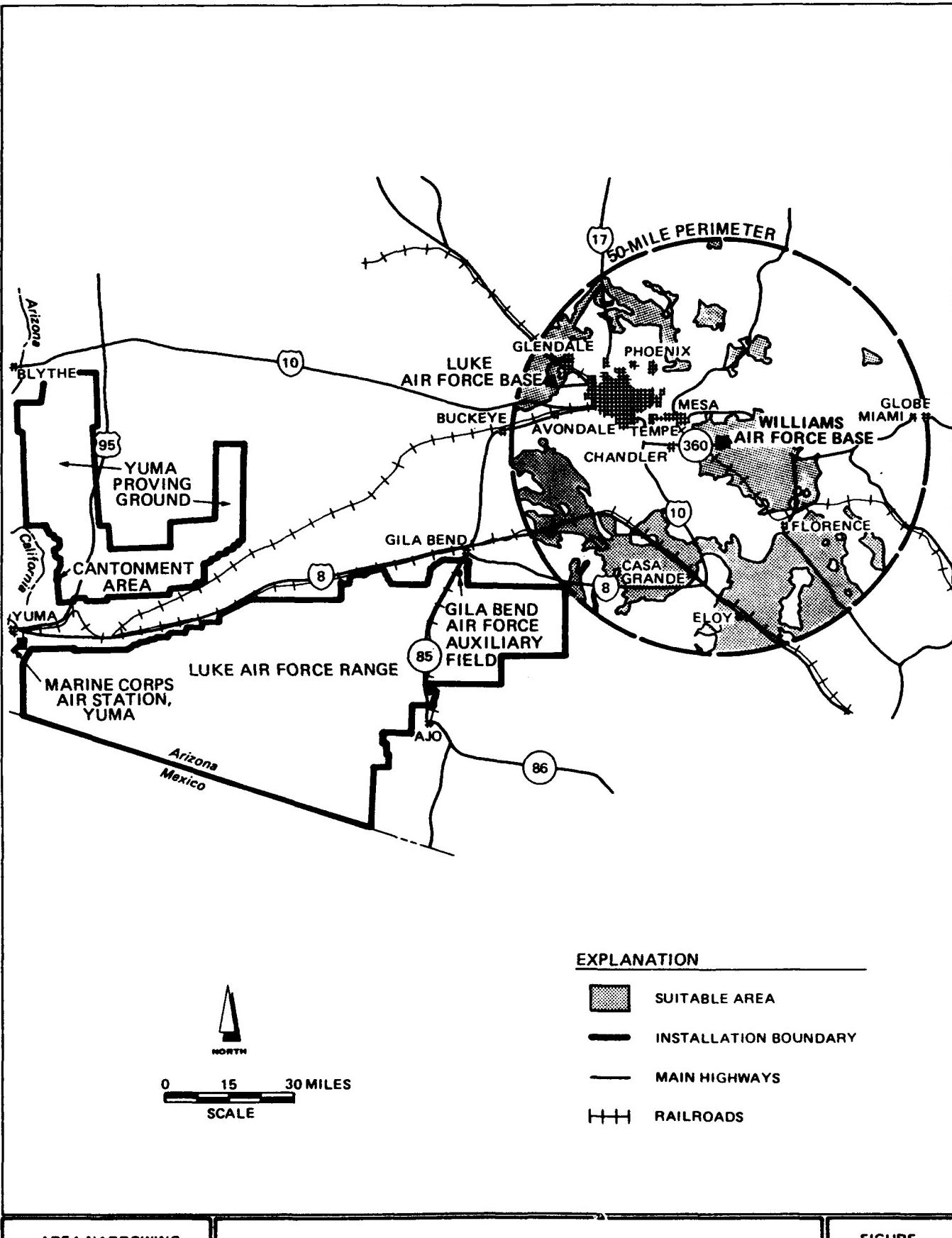
Environmental Impacts: The majority of the potential Deployment Area is in attainment for all major air pollutants. Only one parcel near Phoenix is not in attainment and activities within that parcel would be likely to affect a Prevention of Significant Deterioration (PSD) Class I area if selected for Hard Silo deployment. Activities within the other parcels would be unlikely to affect any PSD Class I areas. Cultural resource sites located in one parcel of the potential Deployment Area are listed in the National Register of Historic Places. Additional cultural resource sites may be discovered if a detailed field survey were performed in the potential Deployment Area. Five parcels contain Wilderness Study Areas and RARE II areas; these areas are only 3 percent of the potential Deployment Area. National/State forest lands occur in

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three small parcels located northwest of the base; the lands affect 3 percent of the potential Deployment Area. There are no experimental ranges/farms in the suitable area parcels.

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D-2.3 Williams Air Force Base, Arizona

After evaluating the alternatives within the complex in relation to each other, Williams Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were that the potential deployment areas are dissected by transportation and utility corridors and there is little land available on base for facility expansion without excessive mitigation for cultural resources.

Williams AFB is located in south-central Arizona, approximately 17 miles southeast of Phoenix (Figure D-2-3). The base currently supports an Air Force Air Training Command mission.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Williams AFB would provide numerous options for siting the Hard Silo system. The potential Deployment Area encompasses 2,339 square miles of suitable area in nine parcels. Eight of these parcels range in size from 6 to 439 square miles and are distributed to the north and west of the base. The ninth parcel is 1,410 square miles in area and is located to the south of the base.

Security concerns within the potential Deployment Area would be minimal due to the generally low density of

inhabited structures; however, two parcels located northwest and south of the Phoenix area pose potential security concerns. Within these two parcels, 51 and 33 percent of the area, respectively, contains a low density of inhabited structures. The presence of these structures poses siting and security concerns greater than those found in the remaining seven parcels. Existing transportation and utility corridors affect portions of the potential Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities at Williams AFB would be enhanced by the proximity of Mesa (7 miles), the nearest community with a wide range of goods and services. Within the potential Deployment Area, accessibility to base maintenance facilities is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to parcel areas from the Main Operating Base range from 18 to 78 road miles and average 58 road miles. This distance could hamper maintenance operations.

Williams AFB anticipates no reduction in present mission operations that might increase the availability of existing base facilities to support a Hard Silo mission. Land available at Williams AFB for facility

expansion, including Weapons Storage Area/Stage Storage Area facilities, to support the Hard Silo mission is constrained. An important archaeological site is located on undeveloped land at the base. This site is of National Register quality and is a candidate for inclusion on the Federal list. Development of the land would require that mitigating measures be developed and implemented. The land on base is 90 percent DOD fee owned.

The utility infrastructure at Williams AFB is adequate for current base operations, and the proximity to Mesa presents a high potential to expand the present capacity to meet future needs. A proposed electrical power upgrade will increase available power by 67 percent over present use. A 50 percent increase in the supply of gas for heating is available from the Southwest Gas Company. Solid waste is collected by a private contractor and disposed of at county facilities. Waste-water treatment facilities on base have a capacity of 1 million gallons-per-day. Present demand varies from 35 to 110 percent of capacity. The facilities have limited expansion capabilities. The base has a channel/dike storm drainage system designed to divert off-base storm runoff around the base perimeter. Adequate on-base drainage consists of storm sewers, open ditches, culverts, and gutters. Surface

water for on-base project demands may be available from the Central Arizona Project when it is completed in 1986. Ground water may also be developed but such development would continue overdrafting of the ground-water basin. Ground water is of poor quality locally and may require more than conventional treatment prior to domestic use.

Williams AFB has a good transportation system. The base has two parallel, fully instrumented, 10,000-foot runways. Interstate Highway 10 and State Highway 360 provide access to the area, but congestion can be heavy during peak traffic hours. A railroad spur that once ran on base has been removed and the right-of-way sold.

Because Williams AFB is operated by the Air Force, the existing logistic and personnel support systems would be compatible with Hard Silo system operations.

The support services for Williams AFB are good, as indicated by the proximity to the support community and the availability of housing. The base is close to Mesa and surrounding communities of the Phoenix urban area which can provide a wide range of goods, services, and facilities. Although on-base housing is at capacity and there are no plans for expansion, Mesa and other communities offer available housing units within 10

miles of the base. Rental and ownership costs, however, are anticipated to be relatively high.

System Practicability: Construction aggregate is available through purchase and/or direct development and sources are distributed throughout the region. Eight percent of the potential Deployment Area contains adverse terrain, which is predominantly located in three parcels east of the base. This condition may impose some minor system siting constraints and could increase construction and security surveillance costs. Surface water from the Central Arizona Project may be available to support construction and operation activities in some areas. Sufficient ground water to support construction and operation may be available through the purchase/transfer of existing water rights. Overdrafting of most ground-water basins is presently occurring and would continue. Ground-water quality is poor and will require more than normal treatment prior to some construction uses.

Public Impacts: There would be minimal land-use conflicts from deployment of the Hard Silo system within the potential Williams AFB Deployment Area. Although the majority of the potential Deployment Area contains rangeland, approximately 26 percent of the potential Deployment Area is under agricultural

development. None of the potential Deployment Area is classified as prime and unique farmland and no timberlands are present. Presently, 42 percent of the townships in the potential Deployment Area have 20 percent or more area under energy or mineral claim/lease. High value mineral resource areas occur in 2 percent of these townships. No known energy resource areas are present. Future land-use development plans and trends are not expected to adversely affect the Deployment Area.

There is limited potential for Hard Silo deployment on DoD/DoE installations within 50 miles of Williams AFB. Only 12 square miles of suitable area, or less than 1 percent of the potential Deployment area, occurs on DoD installations within 50 miles of Williams AFB. Eight square miles occur on Williams AFB. The majority of this suitable area is presently developed. Ownership of the majority of potential Deployment Area is private, but some land is state-owned, and there is a limited amount of federally administered (BLM) land.

Existing transportation and utility corridors affect approximately 36 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. Water resource demand from project-related workers and their dependents would have

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a minimal effect on the surrounding communities because of the potential availability of Central Arizona Project water, and possible purchase/transfer of ground-water rights. Use of ground water would continue basin overdrafting. Ground-water quality is locally poor and the water may require more than conventional treatment prior to domestic use.

Natural hazards in the potential Deployment Area are considered minimal. Approximately 6 percent of the potential Deployment Area is located within identified 100-year floodplains. Because generally few structures within the parcels are inhabited, public safety concerns within the potential Deployment Area would be minimal.

The three-county region of influence surrounding Williams AFB has a relatively large population, centered in the Phoenix metropolitan area, which would minimize social and economic concerns raised by Hard Silo system deployment. Nonagricultural employment in the region is relatively high, implying a small requirement for immigration of project-related workers. Regional employment in the construction and military sector is relatively high, which would minimize the likelihood of an influx of workers with backgrounds dissimilar to the resident populations. The economic

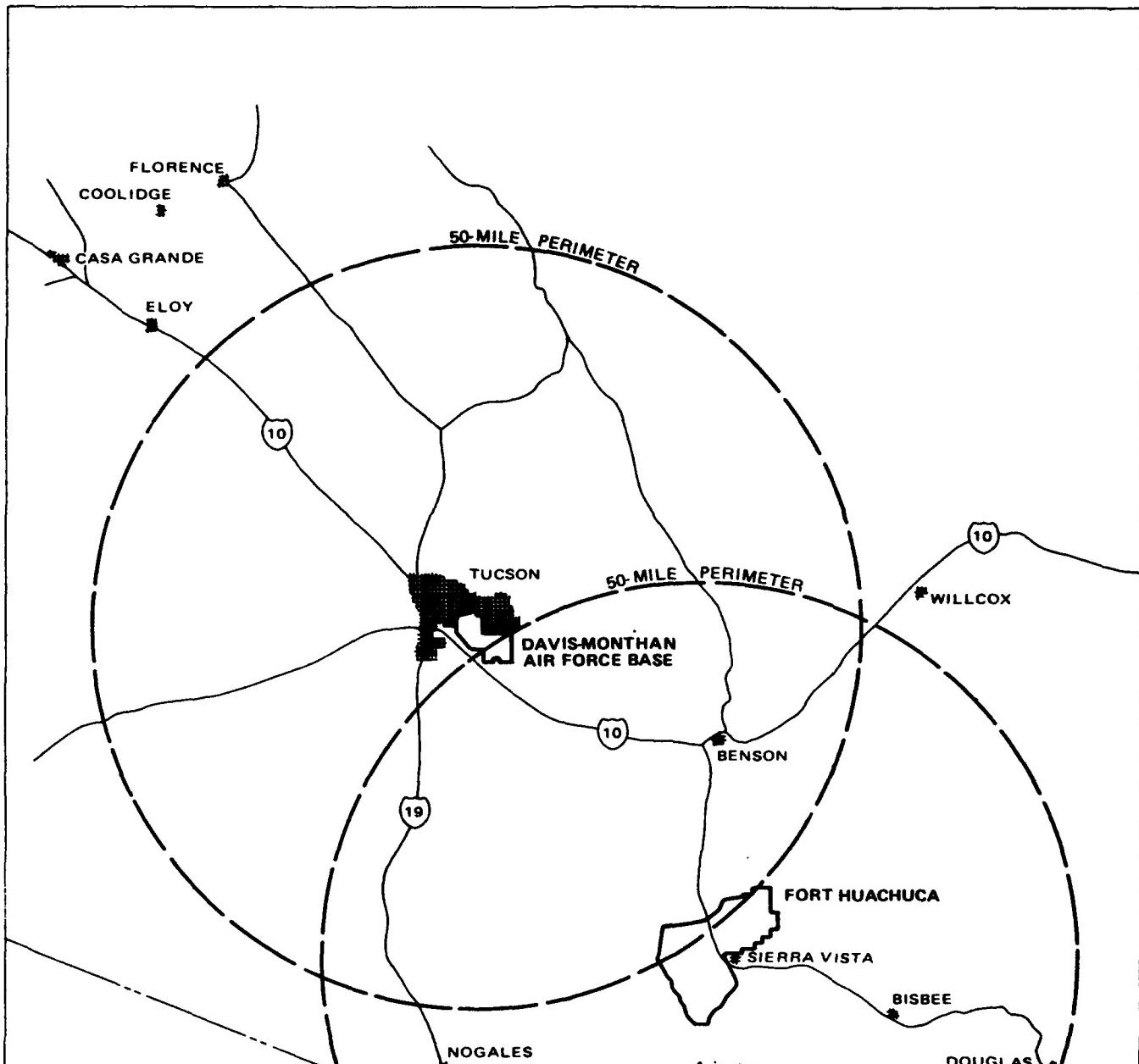
diversity of the region is high as indicated by the number of export-producing industries in the region. Local governments in the region can capture tax revenues in the short run to address potential expenditure demands. The support community has a sizable number of available housing units.

Environmental Impacts: Four suitable area parcels in the Phoenix area are in non-attainment for three major air pollutants. In addition, activities within one of these parcels would be likely to affect a Prevention of Significant Deterioration (PSD) Class I area. The five remaining parcels are in attainment for all major air pollutants and are unlikely to affect any PSD Class I areas. Numerous cultural resource sites located within the potential Deployment Area are listed in the National Register of Historic Places. One site is located within the base and other sites occur throughout the area. Additional sites are likely to occur if a detailed field survey were performed in the potential Deployment Area. Two parcels contain Wilderness Study Areas and RARE II areas, which affect only 1 percent of the potential Deployment Area. National/State forest land is present in six parcels located north and northeast of the base and affects 5 percent of the potential Deployment Area. Four of these parcels contain 80 to 100 percent National/State

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forest land. There are no experimental ranges/farms in
the potential Deployment Area.

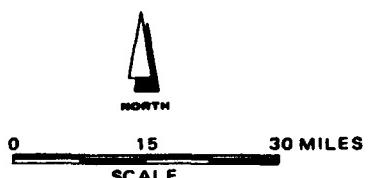
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EXPLANATION

— INSTALLATION BOUNDARY

— MAIN HIGHWAYS



AREA NARROWING
REPORT
VOLUME III

ARIZONA - SOUTHEASTERN COMPLEX

FIGURE
D-3

D-44
SENSITIVE

D-3 Arizona - Southeastern Complex

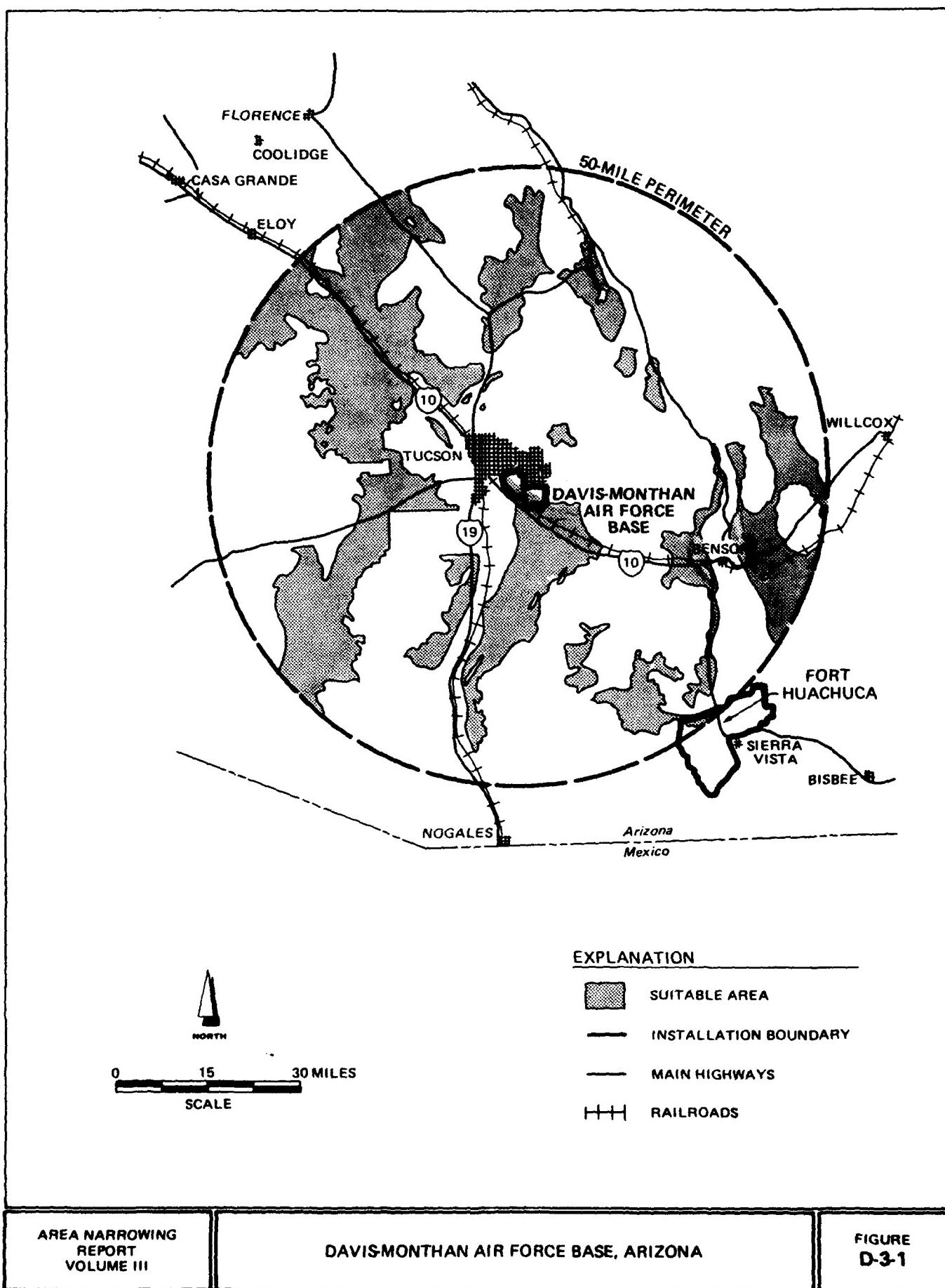
Following application of the Exclusionary Criteria, Davis-Monthan Air Force Base and Fort Huachuca were grouped into a complex (Figure D-3).

Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of Fort Huachuca and its potential Deployment Area. Davis-Monthan AFB remains after application of the Evaluative Criteria to the 14 complexes. No determination has been made at this time regarding the overall advisability of using this Tactical Air Command installation to support a Strategic Air Command mission.

The major factors in eliminating Fort Huachuca were the distances to the more feasible deployment areas and the limited support services available in the immediate vicinity.

The following sections elaborate on the performance of each potential Main Operating Base and its associated Deployment Area with regard to the Evaluative Criteria.

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D-3.1 Davis-Monthan Air Force Base, Arizona

After evaluating the alternatives, Davis-Monthan Air Force Base (AFB) remains for further, more detailed study. The potential Main Operating Base/Deployment Area has favorable characteristics for Hard Silo deployment. The potential Deployment Area contains several large suitable area parcels, on-base land is available for construction of new facilities to support the Hard Silo mission, the base is served by a good transportation system, and there is a nearby community with a wide range of goods and services. In addition, Davis-Monthan is an Air Force base where an ICBM wing has been recently decommissioned.

Davis-Monthan AFB is located in south-central Arizona, adjacent to and southeast of Tucson (Figure D-3-1). Phoenix is approximately 90 miles to the northwest. The base is an Air Force Tactical Air Command installation.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Davis-Monthan AFB would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of 14 suitable area parcels that total 2,224 square miles. Thirteen of these parcels range in size from 8 to 297 square miles and are distributed in

the eastern two-thirds of the region. One large parcel, containing 1,094 square miles, lies in the western one-third of the region.

Security concerns within the potential Deployment Area are minimal due to the overall low density of inhabited structures. Areas of increased security concern include the parcels situated adjacent to Tucson, which have areas of high density inhabited structures. The presence of these structures pose siting and security concerns greater than those found in the remaining parcels. Transportation and utility corridors affect portions of the potential Deployment Area and cause additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be enhanced by the proximity of the support community of Tucson. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to the suitable area parcels from the base range from 10 to 56 road miles and average 46 road miles. These distances could hamper maintenance operations.

Due to the recent decommissioning of the Titan missile wing, Davis-Monthan AFB offers some excess support

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facilities that could be used by the Hard Silo mission. An Air Force training mission for the Ground Launch Cruise Missile has recently occupied some of the facilities previously used by the missile wing; however, some facilities are still available. Existing ordnance storage areas and undeveloped land could support new Weapons Storage Area/Stage Storage Area and support facilities for the Hard Silo mission. Presently, 57 percent of the on-base land at Davis-Monthan AFB is DoD fee-owned, while the remaining area is leased.

The utility infrastructure at Davis-Monthan AFB is adequate for current base operation and several utilities have potential for increased capacity. Electrical power is supplied by Tucson Electric Power and Lighting and has sufficient capacity (presently 42 percent under maximum) to handle the increased demands of the Hard Silo mission. Waste-water treatment is managed by the Pima County Sanitary District and also has sufficient capacity for growth. The base storm drainage system adequately handled a 100- to 500-year flood in 1983. The natural gas heating service, provided by Southwest Gas Corporation, and the solid waste disposal service, provided by off-base contractors, are anticipated to be readily expandable to meet the increased demands of the Hard Silo mission.

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Sufficient surface water to meet increased base needs due to the Hard Silo mission may be available from the Central Arizona Project, only if the anticipated pipeline is completed in the 1990s. The use of ground water to support the Main Operating Base is questionable because considerable overdrafting is presently occurring in the ground-water basin. Ground water does not presently require more than conventional treatment prior to domestic use, but may in the future due to deteriorating quality.

An excellent transportation system serves Davis-Monthan AFB. The base has a fully instrumented, 13,645-foot runway to receive air-lifted materials and personnel; the base is also within 8 road miles of the Tucson International Airport. Access to the base from Interstate Highways 10 and 19 is less than 1 mile to the southwest and 5 miles to the northwest, respectively. A main line of the Southern Pacific Railroad passes the southwest edge of the installation and an active spur line provides access to the center of the base.

Because Davis-Monthan AFB is an Air Force installation, the logistic and personnel support systems would be compatible with the Hard Silo mission.

The support services for Davis-Monthan AFB are adequate, as indicated by the availability of housing

and the proximity to a support community. On-base housing is extremely limited, with a 99 percent occupancy rate. The adjacent community of Tucson offers a wide range of goods and services as well as a good supply of moderately priced housing.

System Practicability: Construction aggregate is available through purchase and/or direct development of sources distributed throughout the region. Adverse terrain is present in all suitable area parcels and constitutes 27 percent of the potential Deployment Area. In five of the 13 parcels, adverse terrain affects 98 to 100 percent of the suitable area. These conditions may impose some system siting constraints and can increase construction and security surveillance costs.

It is questionable whether sufficient surface and/or ground water is available in the potential Deployment Area through purchase/transfer of existing water rights to support system construction and operation. Several overdrafted ground-water basins in the area are in state management areas and additional development would not be viewed favorably. Ground water is of poor quality in some areas and water may require more than conventional treatment prior to some construction uses.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the

potential Davis-Monthan Deployment Area is minimal. Agricultural development occurs in 4 percent of the potential Deployment Area; 3 percent of the potential Deployment Area is classified as prime and unique farmland. A small amount of timberland occurs in three parcels located northeast of Davis-Monthan AFB and affects 3 percent of the potential Deployment Area. Future land use development plans and trends for the Tucson area are well documented and will adversely affect a minimal amount of the potential Deployment Area. Presently, 21 percent of the townships in the potential Deployment Area have 20 percent or more area under energy and mineral claim/lease. None of these townships has known energy resource areas, but 9 percent of the townships have high value mineral resource areas.

Fifteen square miles of suitable area are contained on Davis-Monthan AFB. An additional 7 square miles of suitable area are present on other DoD installations within 50 miles of Davis-Monthan AFB. On-installation suitable area totals 1 percent of the potential Deployment Area. This small amount of suitable area provides very limited options for on-base deployment. In addition, much of the on-installation suitable area is presently developed. The majority of the potential Deployment Area is state land with some private land

and a small amount of federally administered (BLM) land.

Transportation and utility corridors affect 29 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system.

The effect of the increased water demand on the support community from the induced work force and their families will be substantial. It is questionable whether sufficient surface and/or ground water will be available. Demand may exceed surface water availability if the Central Airzona Project pipeline from Phoenix to Tucson is not completed in the early 1990s and additional overdrafting of the ground-water basin will not be viewed favorably.

Natural hazards in the potential Deployment Area are considered minimal. Portions of nine suitable area parcels lie within identified 100-year floodplains and affect 12 percent of the potential Deployment Area. Public safety concerns should be minimal due to the overall low density of inhabited structures within the potential Deployment Area.

The five-county region of influence containing Davis-Monthan AFB has a relatively low population, but the proximity of Tucson should offset some regional

disadvantages. Nonagricultural employment in the region is also low, which could increase the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is also relatively low, which suggests that new project-related workers may have backgrounds dissimilar to those of the resident population. The economic diversity of the region is relatively high based on the number of export-producing industries. Local governments should be able to capture tax revenues in the short term, which implies they can address potential expenditure demands. Housing availability in the region is average. Most of the comparative regional disadvantages will probably be offset by the proximity of Tucson and its likely ability to provide a good proportion of necessary goods and services.

Environmental Impacts: Seven suitable area parcels in the Tucson area are in non-attainment for at least two major air pollutants. Deployment activities within two of these seven parcels would be likely to affect a Prevention of Significant Deterioration (PSD) Class I area. The six remaining parcels are in attainment for all major air pollutants and activities within these parcels would be unlikely to affect any PSD Class I areas. Portions of the potential Deployment Area that lie within a 30-mile radius of two observatories

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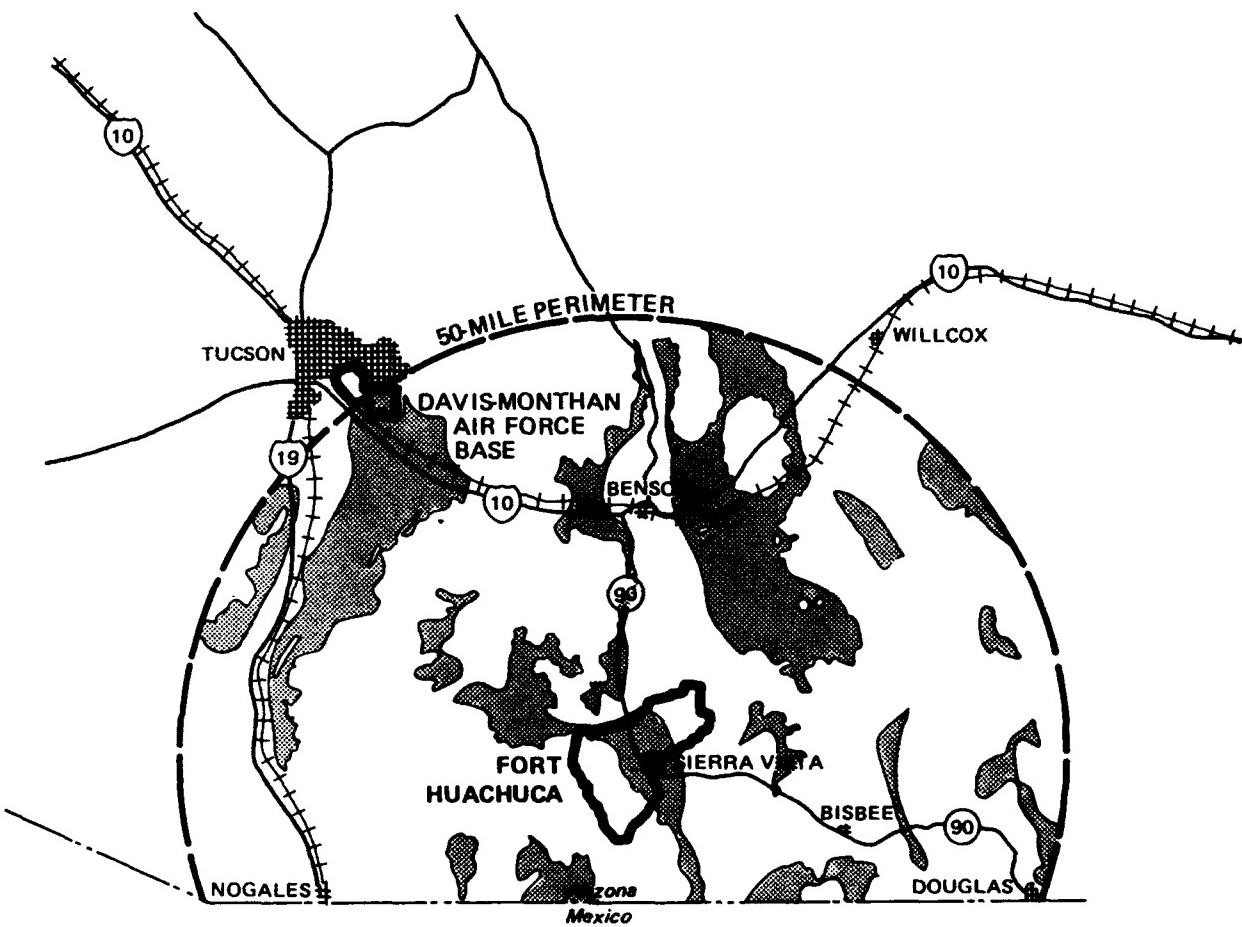
located south and southwest of Davis-Monthan AFB are subject to special air quality/visibility standards.

No cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based on the cultural history of the region, discovery of these types of cultural resource sites is possible if a detailed field survey were performed in the potential Deployment Area.

There are no Wilderness Study Areas or RARE II areas within the potential Deployment Area. Experimental ranges/farms are present in two parcels and affect 4 percent of the potential Deployment Area.

National/State forest lands affect less than 1 percent of the potential Deployment Area.

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EXPLANATION

- [Shaded square] SUITABLE AREA
- [Thick black line] INSTALLATION BOUNDARY
- [Solid line] MAIN HIGHWAYS
- [Dashed line] RAILROADS

0 15 30 MILES
SCALE

AREA NARROWING
REPORT
VOLUME III

FORT HUACHUCA, ARIZONA

FIGURE
D-3-2

D-3.2 Fort Huachuca, Arizona

After evaluating the alternatives within the complex in relation to each other, Fort Huachuca was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the distances to the more feasible deployment areas and the limited services available in the immediate vicinity.

Fort Huachuca is located in southeastern Arizona, adjacent to the city of Sierra Vista and approximately 55 miles southeast of Tucson (Figure D-3-2). The base, under Army command, is used for research and testing of electronic systems and equipment as well as specialized individual and unit training.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Fort Huachuca would provide numerous options for siting the Hard Silo system. The potential Deployment Area encompasses 1,300 square miles distributed among 15 suitable area parcels. Eleven of these parcels range in size from 12 to 59 square miles. The four remaining parcels range in size from 100 to 384 square miles.

Security concerns within the potential Deployment Area would be minimal due to the overall low density of

inhabited structures; however, small portions of two parcels, one surrounding the community of Sierra Vista and one adjacent to the Mexican border, contain a high density of inhabited structures. The presence of these structures pose siting and security concerns greater than those found in the remaining 13 parcels.

Transportation and utility corridors affect portions of the potential Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities at Fort Huachuca would be enhanced by its location adjacent to the community of Sierra Vista. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base.

Although there are parcels adjacent to the base, travel distances range from 0 to 142 road miles, and the average distance from the base to the suitable area parcels is 62 road miles. This distance could hamper maintenance operations.

The base does not expect a mission loss that would increase the availability of existing facilities for the Hard Silo mission. Land is available on Fort Huachuca for new support facilities including Weapons

Storage Area/Stage Storage Area facilities to support the Hard Silo mission. Presently 98 percent of the land on-base is either DoD fee-owned or land withdrawn for military use.

The utility infrastructure at Fort Huachuca is adequate for present base operations, with a potential for expanding capacities of utilities. Electrical power is presently supplied by Tucson Electric Power. Capacity is more than adequate to supply present base needs and could handle as much as double the existing demand. Natural gas, the primary fuel used for heating at the base, is supplied by Arizona Public Service and the supply is adequate to meet all present and future demands. Waste-water treatment facilities on-base are more than adequate to meet present demand but may require upgrading to accommodate future growth. Solid waste is collected by private contractor and disposed of in the Huachuca City landfill, which has a remaining life of approximately 10 years. Efforts are presently underway to identify a location for a new landfill. The base storm drainage system is inadequate to handle runoff from heavy rains, and flash flooding of roads frequently occurs on-base. Additional surface and ground water could be made available to the base to support the Hard Silo mission through the purchase/transfer of existing water rights. The

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ground-water basin is presently being overdrafted and is under consideration by the state for Active Management status. Any additional overdrafting would not be viewed favorably. Ground water is of poor quality in local areas and may require more than conventional treatment prior to domestic use. The base water supply system is adequate for present demand but has a limited capacity for expansion.

Fort Huachuca is served by a good transportation system. The base presently has two instrumented runways, 5,365 feet long and 4,300 feet long, with a new 12,000-foot runway scheduled for completion in 1985. Highway access to the base is provided by State Highway 90, which traverses the base from north to south. There is no rail service to the base; however, rail service is available approximately 10 miles east of the main gate.

Existing Army logistics and personnel support services at Fort Huachuca would need to be augmented to be compatible with the Hard Silo mission.

The support services for Fort Huachuca are good, as indicated by the availability of housing and the proximity to a support community. A large selection of housing at reasonable rates is available adjacent to the base in Sierra Vista. The town of Sierra Vista

(population of about 25,000) is the nearest support community which can provide an adequate range of goods and services.

System Practicability. Construction aggregate is available through purchase and/or direct development and sources are distributed throughout the region. Forty-one percent of the potential Deployment Area contains adverse terrain. This condition may impose some system siting constraints and can increase construction and security surveillance costs. It is likely that ground water could be obtained in the potential Deployment Area through purchase/transfer of existing water rights to support construction and operation of the Hard Silo system. All ground-water basins in the region are presently in overdraft and additional overdrafting would be not be viewed favorably by the state. Ground water is of poor quality in local areas and may require more than conventional treatment prior to some construction uses. Surface water may be available in a small portion of the Deployment Area through purchase/transfer of existing water rights. Surface water is also of poor quality locally and may require treatment prior to some construction uses. The portion of the Deployment Area northwest of Fort Huachuca and near the city of Tucson may be able to obtain water from the Central Arizona

Project; however, the Project is not scheduled to be completed in the Tucson area until the 1990's, a schedule that may may not coincide with the demands of construction of the Hard Silo system. Central Arizona Project water will not require more than conventional treatment prior to construction use.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the potential Deployment Area is minimal. Agricultural land is present in 1 percent of the Deployment Area, and none of the potential Deployment Area is classified as prime and unique farmland. Potential timberlands are located in four separate parcels and cover 3 percent of the the Deployment Area. Future land-use development plans are not expected to adversely affect the proposed use of the Deployment Area. About 28 percent of the townships in the Deployment Area have 20 percent or more area under energy or mineral claim/lease. None of the townships have known energy resource areas. Most of these townships have no high value mineral resource areas, although 4 percent of the townships are located within high value mineral resource areas.

A total of 44 square miles of suitable area occurs on Fort Huachuca with an additional 7 square miles of

suitable area on Davis-Monthan Air Force Base.

However, a majority of this suitable area is developed. The total of 51 square miles of on-installation suitable area provides few options for Hard Silo system deployment on DoD/DoE installations. Four percent of the potential Deployment Area is located on DoD land. The majority of off-base Deployment Area is on private and state owned land, and a small amount is federally administered (BLM) land.

Transportation and utility corridors affect approximately 31 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. Some effect on water availability in the support community of Sierra Vista is likely to occur in order to support project workers and their dependents. The ground-water basin that supplies water to Fort Huachuca and Sierra Vista is under consideration by the state for Active Management status. Additional overdrafting resulting from increased water demand in order to support project workers and their dependents would not be viewed favorably. Development of ground water could be accomplished only through the purchase/transfer of existing water rights. Surface water is presently fully utilized and would be available only through the purchase/transfer of surface water rights. Water from

both sources may be of poor quality locally and may require more than conventional treatment prior to domestic use.

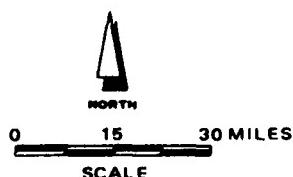
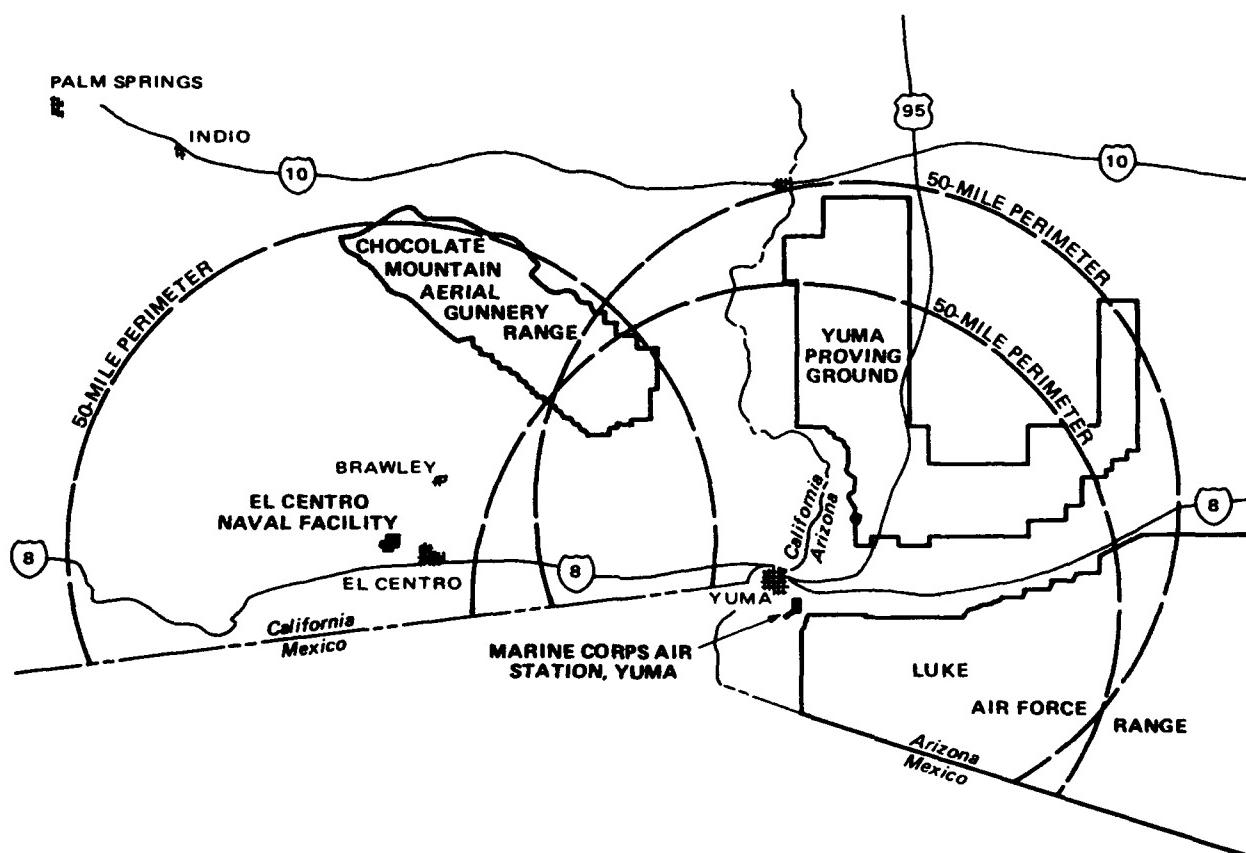
There are few natural hazards in the potential Deployment Area. Small portions of most parcels are located within known 100-year floodplains, affecting 4 percent of the Deployment Area. Public safety concerns should be minimal because most parcels contain isolated inhabited structures or small areas of low density inhabited structures.

Deployment of the Hard Silo system could raise social and economic concerns in the area. The region of influence surrounding the base has a relatively small population implying limited availability of many goods and services. Nonagricultural employment is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is relatively low, which means new workers will most likely have backgrounds dissimilar to those of the resident population. The economic diversity of the region is high, however, based on the number of export-producing industries in the region. Local governments in the region should also be more able to capture tax revenues in the short term to address potential expenditure

demands. A reasonable amount of housing is available in the region. Although some regional indicators are only low to moderate the proximity of Sierra Vista and Bisbee should overcome some regional deficiencies including housing and other services.

Environmental Impacts: Four suitable area parcels near Tucson are in nonattainment for at least two major air pollutants. In addition, deployment activities in the parcel nearest Tucson would be likely to impact a Prevention of Significant Deterioration (PSD) Class I area. Two additional suitable area parcels in the Sierra Vista area are in non-attainment for at least one major pollutant. The five remaining parcels are in attainment for all major air pollutants and activities within those parcels would be unlikely to affect any PSD Class I areas. Cultural resources sites listed in the National Register of Historic Places are located within the potential Deployment Area. Additional sites may be discovered if a detailed field survey were performed in the Deployment Area. No Wilderness Study Areas or RARE II areas are present within the potential Deployment Area. Approximately 4 percent of the potential Deployment Area is occupied by experimental ranges/farms. National/State forest land occurs in five parcels and covers approximately 6 percent of the potential Deployment area.

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EXPLANATION

- INSTALLATION BOUNDARY
- MAIN HIGHWAYS

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ARIZONA/SOUTHERN CALIFORNIA COMPLEX

FIGURE
D-4

D-4 Arizona/Southern California Complex

Following application of the Exclusionary Criteria, El Centro Naval Air Facility, Marine Corps Air Station, Yuma, and Yuma Proving Ground were grouped into a complex (Figure D-4).

Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of all bases except Yuma Proving Ground. In addition, Yuma PG and its potential Deployment Area remain after application of the Evaluative Criteria to the 14 complexes. No determination has been made at this time regarding the overall advisability of using this Army installation to support an Air Force Strategic Air Command mission.

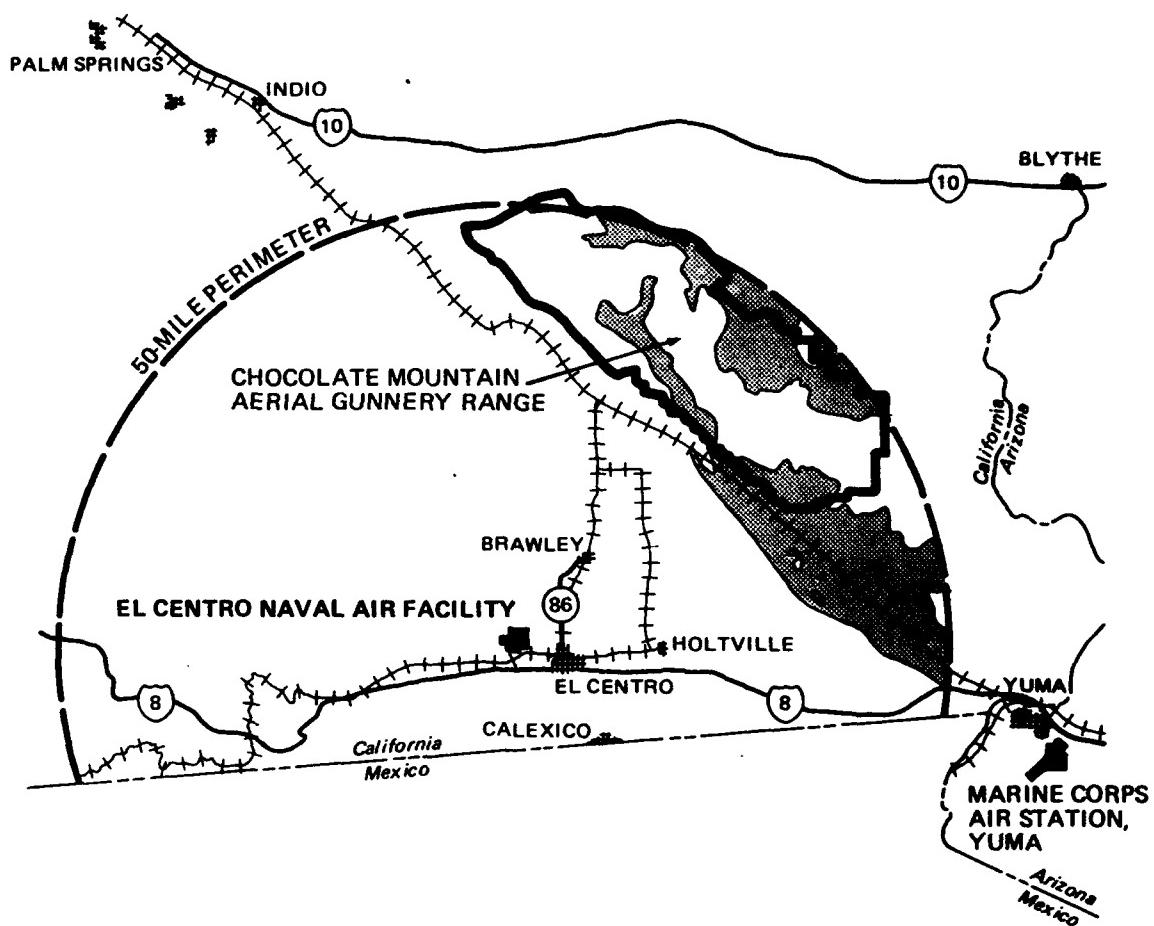
The major factors in eliminating El Centro NAF and MCAS Yuma were:

El Centro Naval Air Facility - distance to the potential deployment areas.

Marine Corps Air Station, Yuma - lack of land on base for facility expansion.

The following sections elaborate on the performance of each potential Main Operating Base and its potential associated Deployment Area with regard to the Evaluative Criteria.

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EXPLANATION

- [Shaded square] SUITABLE AREA
- [Solid line] INSTALLATION BOUNDARY
- [Dashed line] MAIN HIGHWAYS
- [Dashed line with cross-hatching] RAILROADS

0 15 30 MILES
SCALE

NORTH

AREA NARROWING
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EL CENTRO NAVAL AIR FACILITY, CALIFORNIA

FIGURE
D-4-1

D-4.1 El Centro Naval Air Facility, California

After evaluating the alternatives within the complex in relation to each other, El Centro Naval Air Facility (NAF) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. The major influence in this determination was the distance to the potential deployment areas.

El Centro NAF is located in south-central California, approximately 7 miles north of the Mexican border and 5 miles west of the city of El Centro (Figure D-4-1).

The base provides services and material to support various aviation units and activities.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of El Centro NAF would provide numerous options for siting the Hard Silo system. The potential Deployment Area encompasses 546 square miles, distributed between two suitable area parcels. The parcels are 187 and 359 square miles in size.

Security concerns within the potential Deployment Area would be minimal because only a few isolated inhabited structures are present. Transportation and utility corridors affect 17 percent of the potential Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be enhanced by the proximity of the city of El Centro (5 road miles), which could provide a wide range of goods and services. The accessibility to base maintenance facilities from the potential Deployment Area is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. The distances to the two suitable parcels from the base are 57 and 68 road miles; these distances could hamper maintenance operations.

El Centro NAF contains land for new support facilities including Weapons Storage Area/Stage Storage Area facilities to support the Hard Silo mission. Expansion off base is also feasible. Due to recent mission changes at El Centro NAF, there are several buildings on the facility that are vacant; however, no major mission loss is expected that would increase the availability of other facilities for the Hard Silo mission. About half of the land on base is DoD fee-owned.

The utility infrastructure supporting the base is adequate for present base operations, but will require expansion to accommodate Hard Silo deployment. Electrical power is supplied by the Imperial Irrigation District and has sufficient capacity to meet increased

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demands. Heating is presently provided by natural gas supplied by the Southern California Gas Company. The supply is adequate for existing base needs but would require expansion to meet new demands. Waste-water treatment for the base is provided by a sludge treatment plant on base. With a capacity of 300,000 gallons-per-day, the waste-water treatment facilities are adequate for present needs but would require expansion to meet the Hard Silo mission. Solid waste is hauled off base by private contractor to the Imperial County landfill. The capacity of the landfill is presently unknown but is believed to be inadequate to meet new demands. The base storm drainage system consists of underground drainage in the runway areas.

The remainder of the base is adequately drained by natural topography. Additional surface water to meet on-base project demands could be made available from the source that presently supplies the base.

Surface-water quality is not a limiting factor. Ground water could be developed but water quality is poor and more than conventional treatment would be required prior to domestic use.

El Centro NAF is served by a good transportation system. The base has two instrumented runways, 9,500 and 6,823 feet in length. El Centro NAF is presently not served by a railroad. The San Diego and Arizona

Eastern Railroad has an unused line just south of the base, but the nearest operating line is the Southern Pacific rail, running north-south approximately 8 miles east of the base. Interstate Highway 8 is located one mile south of the base and State Route 86 is three miles east; both are accessible by two-lane roads.

Because El Centro NAF is a Naval installation, the logistic and personnel support systems would need to be augmented to be compatible with the Hard Silo mission.

The support services for El Centro NAF are adequate, as indicated by the availability of housing and the proximity to a support community. On-base housing occupancy fluctuates between 75 and 98 percent, and is determined by seasonal mission activity; off-base housing availability also fluctuates seasonally.

Rental rates and housing prices are moderate to high. El Centro (population approximately 24,000) is the largest nearby community that could provide most goods and services.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain, which affects 22 percent of the potential Deployment Area, may impose some system siting constraints. It is likely that sufficient

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ground water will be available in the potential Deployment Area for system construction and operation through direct development. Overdrafting of the ground-water basins would be required but this practice is currently not viewed unfavorably by the state. An international agreement regulates ground-water withdrawal within 5 miles of the United States-Mexico border. Poor quality water in some areas may require more than conventional treatment prior to construction use. Surface water may be available for some of the suitable area through purchase.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system is minimal. Agricultural land covers 11 percent of the potential Deployment Area while prime and unique farmland and timberland do not occur within the potential area. Future land-use development plans are not expected to adversely affect use of the potential Deployment Area. Presently, 76 percent of the townships in the potential Deployment Area have 20 percent or greater area under energy or mineral claim/lease. None of these townships has known energy resource areas; however, 5 percent of the townships contain known mineral resource areas.

The 180 square miles of on-installation suitable area within 50 miles of El Centro NAF provides an adequate

number of options for Hard Silo deployment on DoD installations. The potential Deployment Area contains 33 percent DoD land. The majority of the remaining potential Deployment Area is federally administered (BLM) and a small portion is located on privately owned land.

Transportation and utility corridors affect approximately 17 percent of the potential Deployment Area and decrease siting options available to the Hard Silo system. Presently, most communities obtain surface water from the Imperial Irrigation District. This agency will be required to reduce its water use due to the reduction in Colorado River water available to California. Increased water demand due to the Hard Silo mission in the surrounding communities may require the purchase/transfer of surface water from existing agricultural users. Water quality is not a limiting factor. Ground water could be developed but all ground water in the area is of very poor quality and extensive treatment would be required prior to use.

Natural hazards in the Deployment Area are considered minimal. Only 5 percent of the potential Deployment Area is located within identified 100-year floodplains. The general lack of inhabited structures in parcels minimizes public safety concerns within the potential Deployment Area.

The three-county region of influence surrounding El Centro NAF contains a large population which is mostly concentrated in Riverside County and in the San Diego area over 100 miles to the west of El Centro NAF.

Deployment of the Hard Silo system could raise social and economic concerns in the local area.

Nonagricultural employment in the region is high, which decreases the likelihood of immigration of project-related workers on a regional basis. Regional employment in the construction and military sectors is high, which means that new workers are likely to have backgrounds similar to those of the regional resident population. The regional economic diversity is also high based on the number of export-producing industries in the area. Local governments in the region will be more able to capture tax revenues in the short term to address potential expenditure demands. There are a number of available housing units in the region. Although the regional picture is very positive, the immediate area cannot provide all the goods and services needed and will be subject to more social and economic disturbance than the region as a whole.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would be unlikely to affect any Prevention of Significant

Deterioration Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based on the cultural history of the region these types of cultural resource sites may be discovered if a detailed field survey were performed in the potential Deployment Area. A Wilderness Study Area occupies 12 percent of one parcel, affecting 8 percent of the potential Deployment Area. There are no RARE II areas, experimental farms/ranges, or National/State forest lands in the suitable area parcels.

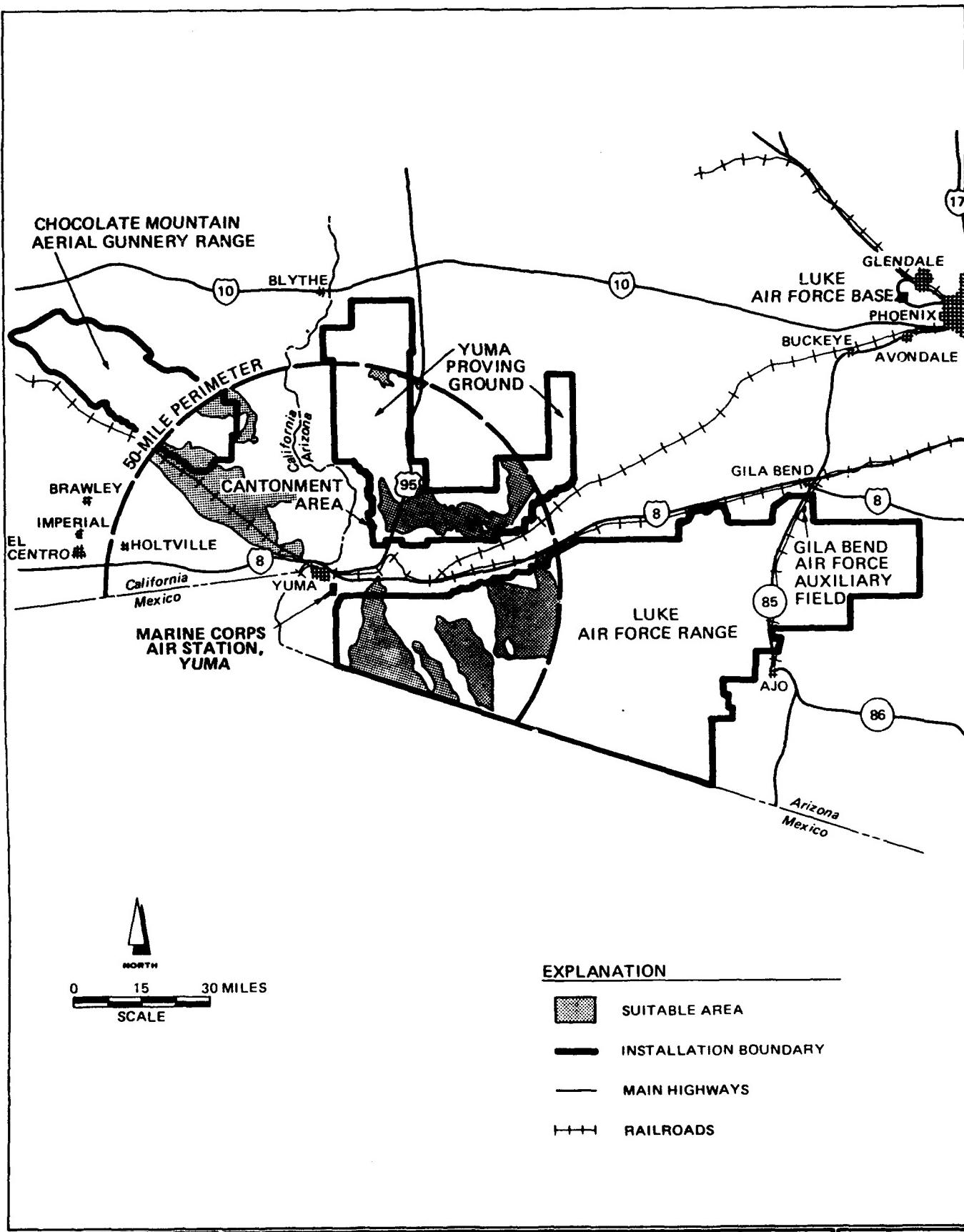
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D-77

SENSITIVE

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MARINE CORPS AIR STATION, YUMA, ARIZONA

FIGURE
D-4-2

D-4.2 Marine Corps Air Station, Yuma, Arizona

After evaluating the alternatives within the complex in relation to each other, Marine Corps Air Station (MCAS), Yuma, was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. The major influence for this determination was the lack of land on base for facilities expansion.

MCAS Yuma is located in southwestern Arizona, adjacent to the city of Yuma (Figure D-4-2). Phoenix, the largest population center in Arizona, is located approximately 157 miles to the northeast. The base provides aerial weapons delivery training.

System Effectiveness: Suitable area parcels within 50 radial miles of MCAS Yuma would provide numerous options for siting the Hard Silo system; however half of the parcels are separated from the base by major geographic barriers: the Colorado River to the west and Gila River to the north. These geographic barriers could constrain system siting. The potential Deployment Area consists of eight suitable area parcels, which comprise a total of 1,226 square miles of suitable area. The parcels range in size from 14 to 355 square miles and are distributed to the southeast, northeast, and northwest of the MCAS Yuma.

The potential Deployment Area contains isolated inhabited structures, which create minimal security concerns. Existing transportation and utility corridors affect portions of the Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be enhanced by the proximity to Yuma, a community that can provide a wide range of goods and services. This support community is adjacent to the northern and western boundaries of the base. The accessibility of the potential Deployment Area to the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the base. Distances to suitable area parcels from the base range from 32 to 71 road miles and average 48 road miles. These distances could hamper maintenance operations.

MCAS Yuma has limited land for expansion. Land available for expansion of facilities, including Weapon Storage Areas/Stage Storage Areas, for the Hard Silo mission is very constrained. Eighty percent of the land on-base is presently DoD fee-owned. The current mission at MCAS Yuma is being expanded to include a fourth squadron. This expansion would reduce the availability of existing support facilities and services for the Hard Silo mission.

The utility infrastructure at MCAS Yuma appears adequate for present base operations and has potential for increased capacity to meet future requirements. The existing electrical power and gas heating systems are capable of meeting increased demand. The waste-water treatment demands can be increased by 40 percent under a co-use agreement with the Yuma Municipal Wastewater Facility, bringing the total capacity to 1.2 million gallons-per-day. Solid waste is deposited at the Yuma County landfill, which has adequate capacity to meet current needs and is believed to have potential for expansion. The base storm drainage system is capable of diverting the typically infrequent seasonal precipitation. Water for the base is obtained from the Colorado River via an open, concrete-lined canal. Additional water supplies to support the increased base needs due to the Hard Silo mission would likely be available from this source. Ground water may be developed but quality may be locally poor and require more than normal treatment prior to domestic use.

MCAS Yuma has a complete transportation system. The base has a fully instrumented, 13,000-foot runway that serves both civilian and military aircraft. Road access is provided by Interstate Highway 8 and U.S. Highway 95, approximately 2 and 2.5 miles to the north.

respectively. Rail service is provided by a spur that connects the cantonment area with the Southern Pacific Railroad, 3 miles to the north.

Because MCAS Yuma is a Marine Corps installation, the existing personnel and logistic support systems would need to be augmented to become compatible with Air Force operations.

The support services for MCAS Yuma are fairly good, as indicated by the availability of housing and the proximity to a support community. The city of Yuma, with a population of approximately 55,000, is adjacent to the base and can provide a full range of support services. On-base housing is presently at maximum occupancy. Additional housing units are under construction but will be fully utilized by current projected mission growth. Available off-base housing is limited.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints and increase construction and security surveillance costs. Adverse terrain is contained in six parcels and affects approximately 13 percent of the

Deployment Area. Sufficient surface water to support system construction and operations may be available for some parcels through purchase or transfer of existing water rights. Limited data exist on the availability of ground water in most parcels. Water may be of poor quality locally and may require more than conventional treatment prior to some construction uses. An international agreement regulates ground-water withdrawal within 5 miles of the United States-Mexico border.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the potential MCAS Yuma Deployment Area is low. The Deployment Area contains less than 1 percent agricultural land, no prime and unique farmlands, nor any timberlands. Future land-use development plans and trends are not expected to adversely affect the Deployment Area. Approximately 71 percent of the townships in the Deployment Area have 20 percent or greater area under energy or mineral claim/lease. High-value mineral or known energy resource areas do not occur within these townships.

On-installation suitable area within 50 miles of Yuma MCAS totals 752 square miles, or 61 percent of the potential Deployment Area, and provides numerous

options for Hard Silo deployment on DoD installations.

The remainder of the Deployment Area is primarily federally administered (BLM) land.

Transportation and utility corridors affect 7 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. The potential water demand of an induced work force and their dependents from deployment of the Hard Silo system on the support community is expected to have a minimal effect on water availability in the support community because of the apparent availability of good quality Colorado River water.

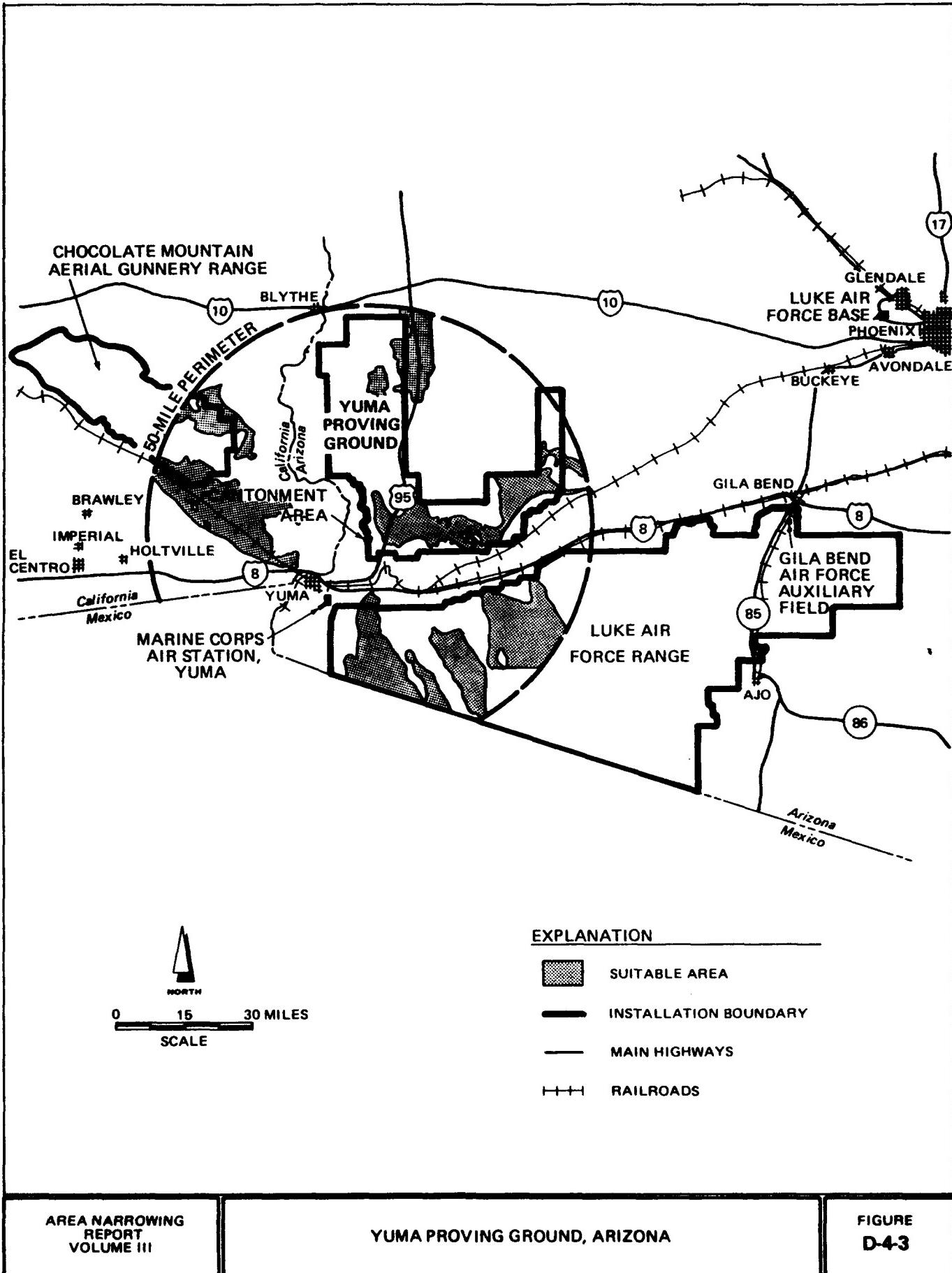
Natural hazards in the potential Deployment Area are minimal. Floodplain data are not available for most of the parcels. Available data indicate that at least 2 percent of the Deployment Area is located within known 100-year floodplains. The general lack of inhabited structures within most of the Deployment Area would minimize public safety concerns.

Although the city of Yuma can provide a reasonably wide range of goods and services, the outlying areas of the region have a very small urban population, implying very limited goods and services for support of system construction and operation. Nonagricultural employment is also very low, which increases the likelihood of

induced immigration of project related workers. In addition, regional employment in the construction and military sectors is very low, which suggests that new workers may have backgrounds dissimilar to those of the resident population. The economic diversity of the region is relatively low, as indicated by the relatively few exporting industries in the region. Local governments in the region may not be able to capture tax revenues in the short term to address potential expenditure demands. The support community is able to provide only limited housing, and housing availability in the region is low.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants. Activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites located in two parcels within the potential Deployment Area are listed on the National Register of Historic Places. Additional cultural resource sites may be discovered if a detailed field survey were performed in the Deployment Area. Portions of two parcels contain Wilderness Study Areas, which occupy approximately 3 percent of the potential Deployment Area. No RARE II areas, experimental ranges/farms, or National/State forest lands are present within the Deployment Area.

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D-4.3 Yuma Proving Ground, Arizona

After evaluating the alternatives among the complexes in relation to each other, Yuma Proving Ground (PG) remains for further, more detailed study. The potential Main Operating Base/Deployment Area has favorable characteristics for Hard Silo deployment. Large areas suitable for system deployment are located both on and off DoD lands, the potential Main Operating Base is contiguous with suitable areas, and the base has a large amount of land available for facility expansion. In addition, there is a nearby community with a full range of goods and services.

Yuma PG is located in southwestern Arizona, northeast of the confluence of the Gila and Colorado Rivers, approximately 24 miles northeast of the city of Yuma (Figure D-4-3). Yuma Proving Ground is an Army installation used for testing and evaluation, product improvement, and acceptance testing of all types of weapons and ammunitions.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Yuma PG would provide numerous options for siting the Hard Silo system. However, the parcels are separated by the Colorado River to the west and the Gila River to the south. These geographic barriers could constrain

system siting. The potential Deployment Area consists of eight parcels, which together comprise 1,487 square miles of suitable area. These parcels range in size from 22 to 358 square miles and are evenly distributed in three general geographical areas. The largest area, south of the Yuma PG and the Gila River, lies almost totally within the boundaries of Luke Air Force Range. The second area is predominantly within Yuma PG. The third area is located west of the Colorado River, in California, within and adjacent to the Chocolate Mountain Aerial Gunnery Range.

Security concerns within the potential Deployment Area would be minimal because of the overall low density of inhabited structures. The existing transportation and utility corridors affect portions of the Deployment Area and would cause additional security concerns.

System Operability: The efficiency of Yuma PG as a Main Operating Base would be enhanced by the distance to Yuma, the nearest community with a full range of goods and services. Accessibility from the potential Deployment Area to base maintenance facilities would be dependent on the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances from the base to suitable area parcels range from 30 to 89 road miles and average 47 road miles. These distances could hamper maintenance operations.

Yuma PG has land available for expansion. Sufficient land for new facilities, including Weapons Storage Area/Stage Storage Area facilities, is available to support the Hard Silo mission. The base is not anticipating a reduction in operations that would increase the availability of existing base facilities for the Hard Silo mission. Presently, 99 percent of the base land is land withdrawn for military use.

The utility infrastructure supporting Yuma PG appears adequate for present base operations and has potential for expansion. However, substantial upgrades of some facilities may be necessary for deployment of the Hard Silo mission. Existing peak electrical power usage is 50 percent below a maximum rated capacity of 12.5 MW. Heating is provided primarily by fuel oil, but the natural gas distribution system could be expanded. Waste-water treatment facilities consist of a series of separate septic tanks or sewage ponds with a total capacity of 0.74 million gallons per day. These facilities are considered in good condition and adequate for present base use. Solid waste is deposited in an on-base landfill that is adequate to meet base requirements and has the potential for expansion. The base storm drainage system is minimal but considered adequate to handle infrequent seasonal precipitation. Surface water to support the

on-base needs of the Hard Silo mission is potentially available by purchase from the Colorado River. Ground water could be developed without a permit, but water quality is poor locally and may require more than conventional treatment prior to domestic use. An on-base water treatment plant is presently under construction but capacity will be sufficient only to meet present base demand.

Yuma PG has a fairly good transportation system. The base has two instrumented runways, one 6,000 feet long and the other 5,030 feet long, with land available for expansion. U.S. Highway 95, a two-lane highway, serves as the main north-south route through the installation and the main route to Yuma. The highway provides access to Interstate Highways 10 and 8, which are 60 miles to the north and 22 miles to the south, respectively. No direct rail service is available on the installation. However, rail service is provided by a base-owned, one-mile spur that connects to the Southern Pacific Railroad, which is located 17 miles south of the cantonment area.

Because Yuma PG is an active Army training and testing installation, the personnel and logistic support systems would need to be augmented to become compatible with the Hard Silo mission.

Yuma PG has good support services, as indicated by the availability of housing and the proximity to a support community. The city of Yuma, with a population of approximately 55,000, can provide a full range of goods, services, and facilities. On-base housing is in good condition and in excess of current mission requirements. Limited off-base housing is available in Yuma.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints and increase construction and security surveillance costs. Eleven percent of the potential Deployment Area contain adverse terrain. Sufficient surface and/or ground water in the potential Deployment Area may be available for system construction and operation from direct development, purchase, or transfer of existing water rights. An international agreement regulates ground-water withdrawal within 5 miles of the United States-Mexico border. The availability and quality of ground water is undocumented in most of the suitable area parcels.

Public Impacts: The potential land-use conflicts from deployment of the Hard Silo system within the Yuma PG

Deployment Area are minimal. There is less than 1 percent agricultural land, no prime and unique farmland, and no timberland within the potential Deployment Area. Currently, 68 percent of the townships in the potential Deployment Area contain 20 percent or greater area under energy or mineral claim/lease. High value mineral or known energy resource areas do not occur within these townships. Future land use development plans and trends are not expected to adversely affect the potential Deployment Area.

There are 334 square miles of suitable area on Yuma Proving Ground, with an additional 661 square miles of suitable area located on Luke Air Force Range and Chocolate Mountain Aerial Gunnery Range (a total of 67 percent of the Deployment Area), which provide numerous options for Hard Silo deployment on DoD installations within 50 miles of Yuma PG. The majority of the remainder of the potential Deployment Area consists of state land and limited amounts of private land.

Transportation and utility corridors affect 7 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. The increased water demand of an induced work force and their families from deployment of the Hard Silo system

would have a minimal effect on the support community due to the apparent availability of Colorado River water. Water quality is good and would require only conventional treatment for domestic use.

Natural hazards in the potential Deployment Area are considered minimal. No data were available regarding floodplains for the majority of the parcels. Of the parcels for which data are available, 2 percent of the Deployment Area is located within known 100-year floodplains. Few inhabited structures are present in the proposed Deployment Area, which would minimize public safety concerns.

Although the city of Yuma can provide a reasonably wide range of goods and services, the outlying areas of the region have a very small urban population, implying very limited goods and services for support of system construction and operation. Nonagricultural employment is very low, which increases the likelihood of induced immigration of project-related workers. In addition, regional employment in the construction and military sectors is relatively low, which suggests that new workers may have backgrounds dissimilar to those of the resident population. The economic diversity of the region is moderate as indicated by the number of export-producing industries presently in the region.

Local governments in the region have a low relative ability to capture tax revenues in the short run to address potential expenditure demands. The support community would be able to provide a moderate amount of housing (due to on-base housing availability), and the availability of housing in the region is very good due to the proximity of the Phoenix metropolitan area.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites located in two parcels within the potential Deployment Area are listed in the National Register of Historic Places. Additional cultural resource sites may be discovered if a detailed field survey were performed in the potential Deployment Area. Approximately 3 percent of the potential Deployment Area is within a Wilderness Study Area. No RARE II areas, experimental ranges/farms, or National/State forest lands are present within the potential Deployment Area.

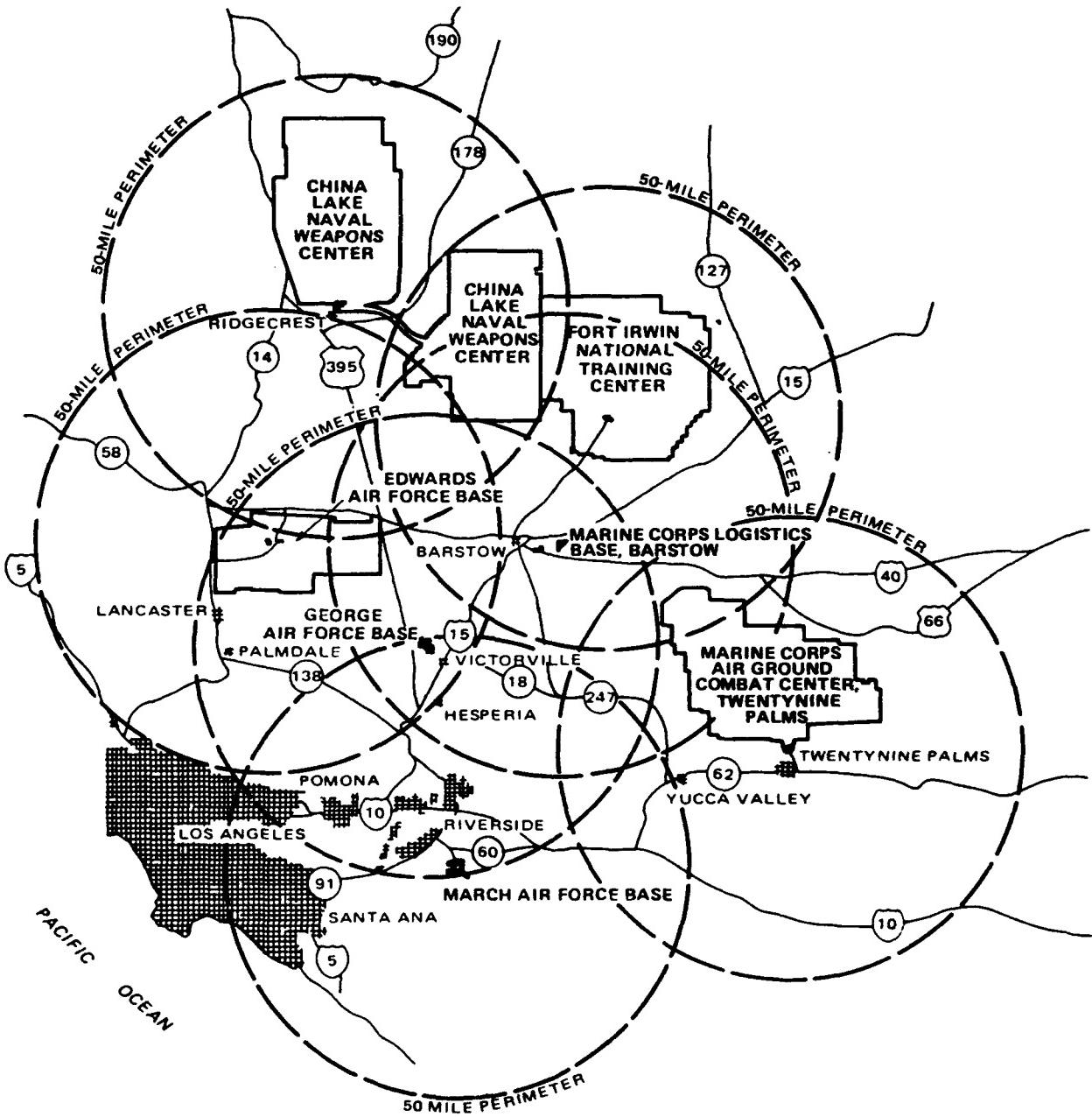
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EXPLANATION

— INSTALLATION BOUNDARY

— MAIN HIGHWAYS

0 15 30 MILES
SCALE

AREA NARROWING
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CALIFORNIA - SOUTH-CENTRAL COMPLEX

FIGURE
D-5

D-5 California - South-Central Complex

Following application of the Exclusionary Criteria, China Lake Naval Weapons Center; Edwards Air Force Base; Fort Irwin National Training Center; George Air Force Base; March Air Force Base; Marine Corps Air Ground Combat Center, Twentynine Palms; and Marine Corps Logistics Base, Barstow, were grouped into a complex (Figure D-5).

Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of all bases except Edwards AFB. In addition, Edwards AFB and its potential Deployment Area remain after application of the Evaluative Criteria to the 14 Complexes. No determination has been made at this time regarding the overall advisability of using Edwards AFB to support an Air Force Strategic Air Command mission.

The major factors in eliminating the bases were:

China Lake Naval Weapons Center - distance to the more feasible potential deployment areas and limited support services available in the immediate vicinity.

Fort Irwin - distance to the more feasible potential deployment areas and the lack of support services in the immediate vicinity.

George Air Force Base - distance to potential deployment areas, limited land available on base for new facilities, and the limited support services available in the immediate vicinity.

March Air Force Base - presence of major transportation and utility corridors in potential deployment areas and the separation of the base from the potential deployment areas by a major mountain range.

Marine Corps Air Ground Combat Center, Twentynine Palms - limited support services available in the immediate vicinity.

Marine Corps Logistics Base, Barstow - distances to potential deployment areas, lack of air transportation facilities, limited land available on base for new facilities, and limited support services available in the immediate vicinity.

The following sections elaborate on the performance of each potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

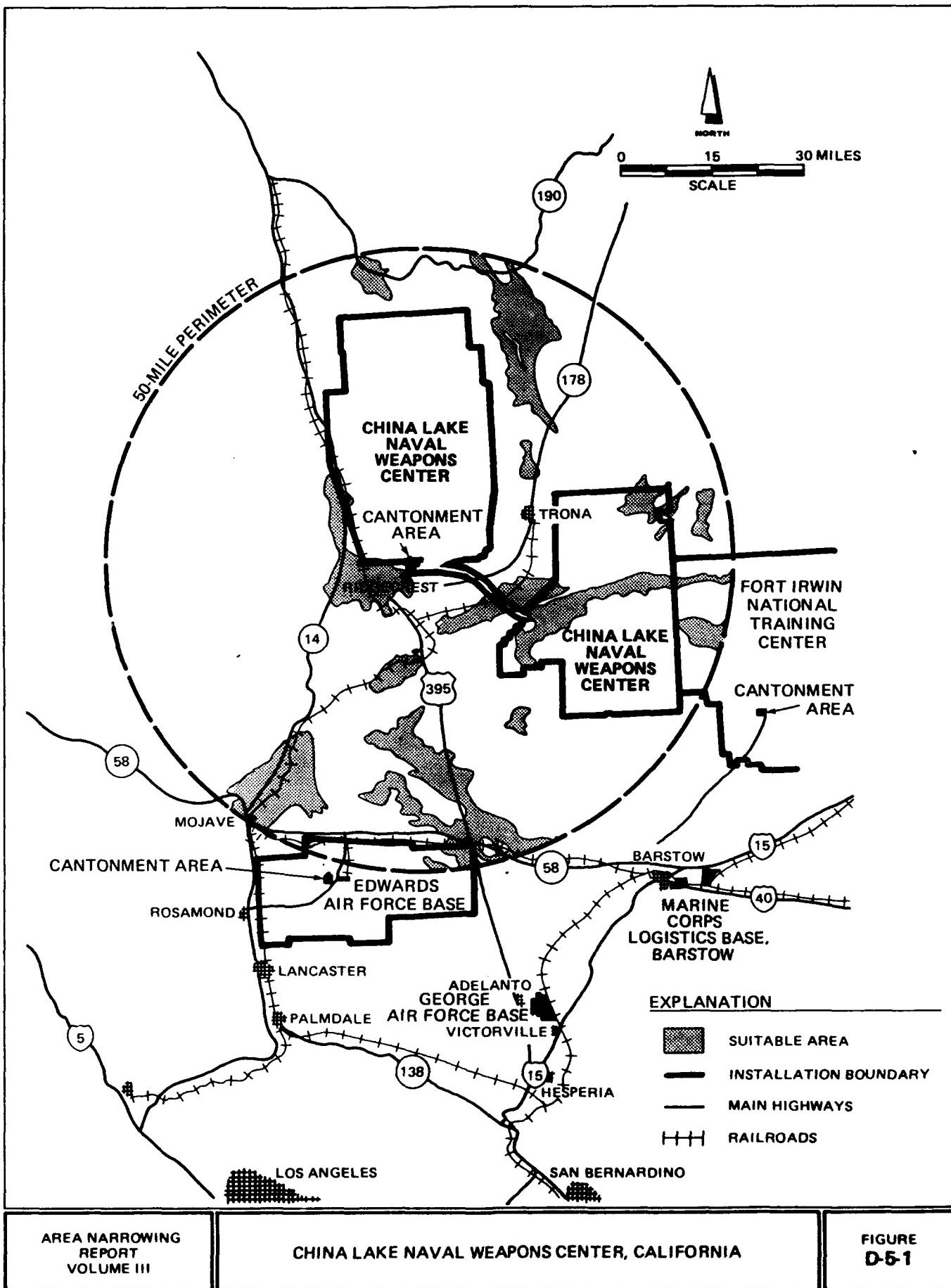
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D-5.1 China Lake Naval Weapons Center, California

After evaluating the alternatives within the complex in relation to each other, China Lake Naval Weapons Center (NWC) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the distances to many potential deployment areas and the limited support services available in the immediate vicinity.

China Lake NWC is located in south-central California, in the northern portion of the Mojave Desert (Figure D-5-1). The base and range serve as a research, development, test, and evaluation center for air warfare and missile weapon systems, as well as for parachute tests and evaluation.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of China Lake NWC would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of 13 suitable area parcels that comprise a total of 909 square miles. The parcels range in size from 8 to 217 square miles.

Security concerns within the potential Deployment Area would be minimal due to the small areas of inhabited

structures. Transportation and utility corridors are present in portions of the Deployment Area, and could raise security concerns.

System Operability: The efficiency of Main Operating Base activities would be degraded by the long distance, approximately 83 road miles, to Lancaster, the nearest community capable of providing a wide range of goods and services. Although the community of Ridgecrest is contiguous with the cantonment area it may be unable to provide the services and facilities required to support the Hard Silo mission. The accessibility to base maintenance facilities from the potential Deployment Area is dependent upon the location of the parcel(s) selected for siting and its distance from the Main Operating Base. Distances to the suitable area parcels from the base range from 10 to 81 road miles; the average distance is 49 road miles, a distance that could hamper maintenance operations.

China Lake NWC has sufficient land available for expansion. Land is available for new support facilities to support the Hard Silo mission. The existing Weapons Storage Areas are sufficient to accommodate the requirements of the Hard Silo system Weapons Storage Area/Stage Storage Area. The base is not anticipating a reduction in future operations that

would increase the availability of existing facilities for the Hard Silo mission. Presently, 98 percent of the land on base is either DoD fee owned or withdrawn for military use.

The utility infrastructure at China Lake NWC is adequate for present base operations, and has a potential capacity for expansion to meet future demands. Electrical power is presently supplied by Southern California Edison, and capacity is sufficient to meet demands for the next few years. Heating is provided by steam-generating plants fired by either gas or oil; these facilities are adequate to meet current demand and are believed to be readily expandable.

China Lake NWC and Ridgecrest share a single waste-water treatment facility, which is owned by the city but located on base. This 3.1 million gallons-per-day capacity facility is adequate to handle loads up to 33 percent over present demand. Solid waste is collected by a contractor and disposed of at the Ridgecrest sanitary landfill. This facility would likely require expansion to accommodate the needs of the Hard Silo mission. The storm drainage system consists of a series of ditches, culverts, and diversion structures that are inadequate to prevent flooding. A project to expand and improve the system is in progress. Although no surface-water supply is available to meet the

increased base needs of the Hard Silo mission, ground water may be available via direct development near the cantonment area. Ground-water quality is locally poor and water may require more than conventional treatment prior to domestic use.

The existing transportation system at China Lake NWC is good, but some expansion would be required to meet Hard Silo mission demands. The base has three partially-instrumented runways with lengths of 10,000, 9,000, and 7,700 feet. Rail service is provided by an off-loading facility at the intersection of the Trona Railroad and the Navy Interrange Access Road, approximately 14 miles southeast of the cantonment area. Highway access is provided by State Highway 178, which passes the main gate and leads to U.S. Highway 395, 6 miles to the west.

Because China Lake is a Naval installation used as a weapons test center, the existing logistic and personnel support systems would need to be augmented to become compatible with Air Force operations.

China Lake NWC has limited support services, as indicated by the long distance to the support community and the availability of housing. The city of Ridgecrest, with a population of about 23,000, is contiguous with the cantonment area, but can offer only

a limited range of goods and services. Lancaster, the nearest community with a wide range of goods and services, is 83 road miles from the base. On-base housing, which is considered adequate for present operations but requires modernization, has an occupancy rate averaging 98 percent. In the Ridgecrest area, rental housing units are limited but reasonably priced housing for purchase is available.

System Practibility: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Approximately 12 percent of the potential Deployment Area contains adverse terrain, which could impose some system siting constraints and increase construction and security surveillance costs. It is likely that sufficient ground water will be available in most of the potential Deployment Area through direct development to support system construction; however, overdrafting of some ground-water basins would continue. State and local regulations, however, do not presently prohibit the practice of overdrafting. Ground water used for construction may be of poor quality locally and water may require more than conventional treatment prior to construction use. Surface water may be available for construction purposes in the parcels located east of the base.

Public Impacts: The potential for land-use conflicts from the deployment of the Hard Silo system within the China Lake NWC Deployment Area is minimal. Only 1 percent agricultural land and less than 1 percent prime and unique farmland are located within the potential Deployment Area. No timberland occurs within the potential Deployment Area. Future land use development plans and trends are not expected to adversely affect the Deployment Area. Approximately 22 percent of the townships within the potential Deployment Area have 20 percent or greater area under energy or mineral resource claims/leases. Known high-value mineral resources occur in 1 percent of these townships, and known energy resources occur within only 1 percent of the townships.

Within a 50-mile radius of the China Lake NWC there is a total of 182 square miles of suitable area on DoD installations (China Lake NWC, Fort Irwin National Training Center, and Edwards Air Force Base). This amount of area (20 percent of the potential Deployment Area) provides some options for Hard Silo deployment on Dod installations within 50 miles of the China Lake Main Operating Base. The majority of the potential Deployment Area is on federally administered (BLM) land, with some on private and state land.

Transportation and utility corridors affect approximately 23 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system.

The water demand in support of deployment of the Hard Silo system is expected to have minimal effect on nearby communities, because it is likely that sufficient ground water is available via direct development, however overdrafting of the basin would continue. Ground-water quality is locally poor and water may require more than conventional treatment prior to domestic use. No surface-water supply is available.

Natural hazards within the potential Deployment Area are considered minimal. Only 2 percent of the Deployment Area occurs within known 100-year floodplains. Only small areas of high density inhabited structures and a few isolated inhabited structures are located within the potential Deployment Area, thus minimizing public safety concerns.

The relatively small urban communities of Ridgecrest and Barstow could be significantly affected if they were to absorb the influx of support personnel and dependents arising from deployment of the Hard Silo system at China Lake NWC. Ridgecrest, which is

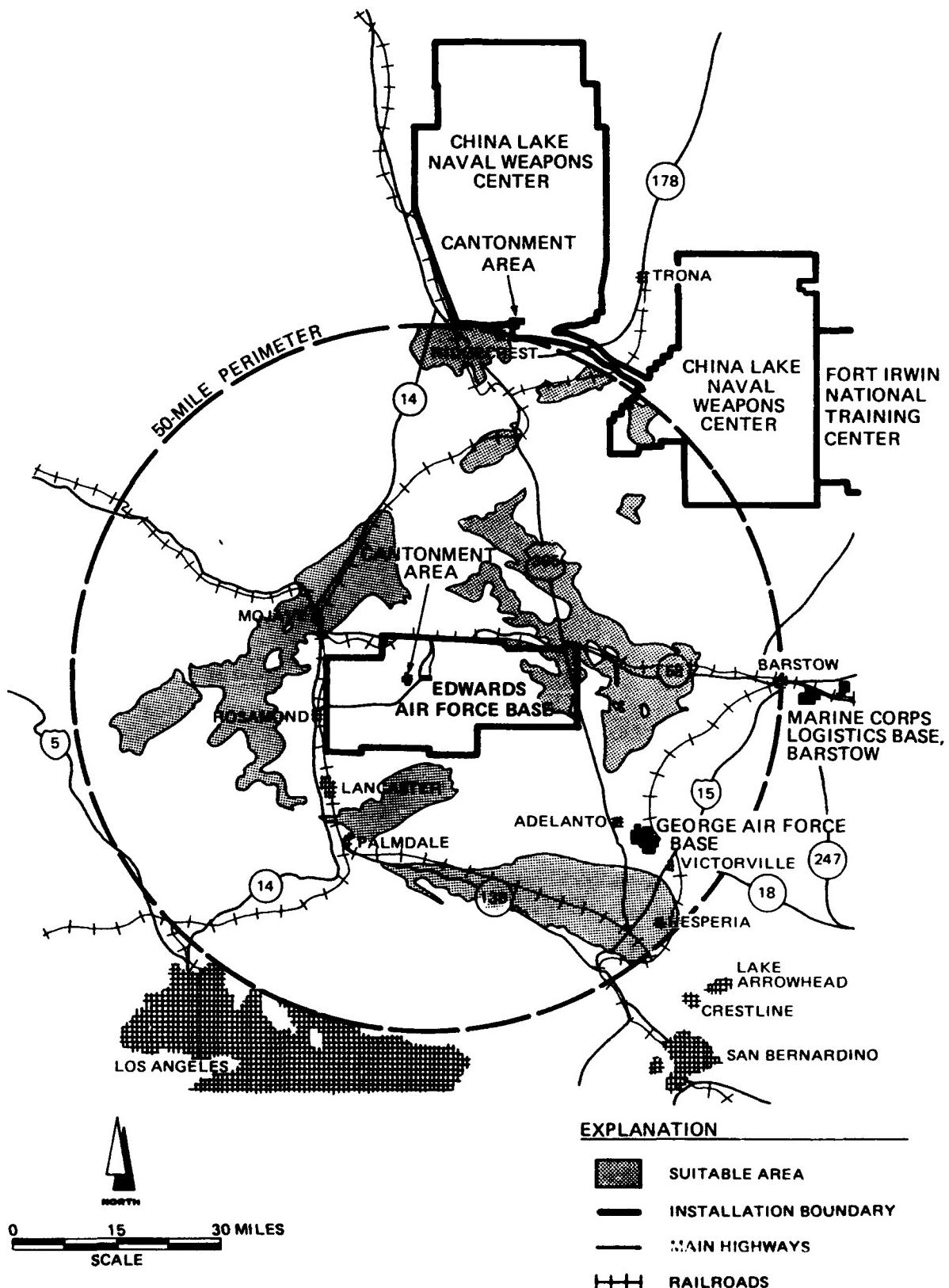
contiguous with the base cantonment area, and Barstow, are the only sizeable communities within approximately 60 miles, but both provide only limited goods and services. The majority of the population and attendant support services are concentrated over 125 miles from the base, primarily in the communities of San Bernardino and Bakersfield. Nonagricultural employment in the region is moderate which increases the likelihood of project-related immigration. Employment in the construction and military sectors is relatively high, which means new workers will most likely have backgrounds similar to those of the regional resident population. The large number of export-producing industries, as compared to other areas, indicates good regional economic diversity. Local governments may not be able to capture enough tax revenues in the short term, however, to address potential expenditure demands. Housing availability in the region is high. The community of Ridgecrest can provide a moderate number of housing units. Rental units are limited.

Environmental Impacts: The potential Deployment Area is in nonattainment for at least two major air pollutants. Activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. No cultural resource sites listed in the National Register of

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Historic Places are located within the potential Deployment Area. Based on the cultural history of the region, these types of cultural resource sites may be discovered if a detailed field survey were performed in the potential Deployment Area. Approximately 7 percent of the potential Deployment Area is within Wilderness Study Areas and RARE II areas; all of this area is concentrated in two large parcels. The potential Deployment Area does not contain experimental ranges/farms or National/State forest land.

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EDWARDS AIR FORCE BASE, CALIFORNIA

FIGURE
D-5-2

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D-5.2 Edwards Air Force Base, California

After evaluating the alternatives among the complexes in relation to each other, Edwards Air Force Base (AFB) remains for further, more detailed study. The potential Main Operating Base/Deployment Area has favorable characteristics for Hard Silo deployment. On-base land is available for facility expansion, and there is suitable area for system deployment on DoD lands within the boundaries of Edwards AFB. In addition, the base is served by a complete transportation system and it has a good utility infrastructure.

Edwards AFB is located in the west-central Mojave Desert of southern California, and is approximately 70 miles from the northern margins of the Los Angeles metropolitan area (Figure D-5-2). Lancaster is approximately 27 miles southwest of Edwards AFB. The base is presently used as a testing station for aviation equipment and includes a mission to support the space shuttle.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Edwards AFB provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of 10 suitable area parcels; the parcels range in size from 8

to 382 square miles and total 1,343 square miles.

Security concerns within the potential Deployment Area would be minimal due to the low density of inhabited structures. Most of the potential Deployment Area is characterized by low density and isolated inhabited structures. Parcels located near population centers pose potential security concerns. The distribution of transportation and utility corridors affect portions of the Deployment Area, causing additional security concerns.

System Operability: The efficiency of Edwards AFB as a Main Operating Base would be degraded by the distance to Lancaster (27 miles), the nearest community that can provide a wide range of goods and services. The accessibility to Main Operating Base maintenance facilities from the potential Deployment Area would be dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to the suitable area parcels from Edwards AFB range from 22 to 76 road miles and average 43 road miles. These distances could hamper maintenance operations.

Edwards AFB has sufficient land available for expansion. Surplus land is available to support new facilities as well as Weapons Storage Area/Stage

Storage Area facilities. The base is not anticipating a reduction in its future operations that would increase the availability of existing facilities for use by the Hard Silo mission. Ninety-nine percent of the land on Edwards AFB is DoD fee-owned land or land withdrawn for military use.

The utility infrastructure at Edwards AFB is adequate for current base operations and has the potential for increased capacity to meet future requirements.

Electrical power usage is presently about 44 percent below the maximum capacity of 245.3 million kWH. Gas heating demands are presently 48 percent below a maximum capacity of 10.7 million therms. The on-base waste-water treatment facility is adequate to meet present demands, but the system may need upgrading to accommodate the demands of the Hard Silo mission.

Solid waste is disposed of at an on-base landfill that has capacity adequate to meet present needs and has potential for expansion. The base storm drainage system consists of open ditches and limited under-street storm drains, which collect runoff and direct it to the Rogers Lake bed. Ground water or surface water may be available through direct development or purchase to meet the increased base demands of a Hard Silo mission. Overdrafting of ground-water basins is presently allowed and would

continue in order to meet increased demands. Although water quality is not presently a problem, with continued overdrafting, ground-water quality could potentially fall below minimum drinking standards.

Edwards AFB has a complete transportation system. The base has a 10,000-foot, fully instrumented runway. The base is accessed by State Highways 58 and 14 and U.S. Highway 395, which border or are within a few miles of the installation on the north, west, and east sides respectively. On-base rail service consists of 23 miles of active spurs connecting to the Santa Fe Railroad.

Because the base is operated by the Air Force, the existing personnel and logistic support system would be compatible with the operations of the Hard Silo mission.

Edwards AFB has good support services, as indicated by the availability of housing and the proximity to a support community. Lancaster, with a population of approximately 55,000, can provide a wide range of goods, services, and facilities. On-base housing occupancy is at capacity, but off-base housing is available at affordable rates in the Lancaster area.

System Practicability: Construction aggregate is available through purchase and/or direct development.

Aggregate sources are distributed throughout the region. Sixteen percent of the potential Deployment Area contains adverse terrain, which may impose some system siting constraints and can increase construction and security surveillance costs. Ground water for system construction and operation may be available in the potential Deployment Area through direct development or purchase, but overdrafting of ground-water basins would continue. Water may be of poor quality in some areas, requiring more than conventional treatment prior to some construction uses.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the potential Edwards AFB Deployment Area is minimal. The majority of the suitable area is open land with approximately 9 percent of the potential Deployment Area under agricultural development. Two percent of the potential Deployment Area is classified as prime and unique farmland. Future land-use development plans and trends for the urbanized areas are not expected to adversely affect the potential Deployment Area. No timberlands are located within the potential Deployment Area. Approximately 18 percent of the townships in the potential Deployment Area have 20 percent or more area under energy and mineral claim/lease. High value mineral resources are present in 4 percent of

these townships, while 2 percent contain known energy resources.

Edwards AFB contains 42 square miles of suitable area, located at the east end of the installation. An additional 16 square miles of suitable area is located on China Lake Naval Weapons Center. This amount of suitable area (4 percent of the potential Deployment Area) provides some options for Hard Silo deployment on DoD installations. Ownership of the majority of the potential Deployment Area is private and some is federally administered (BLM).

Transportation and utility corridors decrease the siting options available to the Hard Silo system and affect approximately 33 percent of the potential Deployment Area. The increased water demand of an induced work force and their families would have a minimal effect on the support community because of the apparent availability of ground water and surface water through direct development or purchase.

Natural hazards in the potential Deployment Area are considered minimal. Approximately 6 percent of the Deployment Area is located within known 100-year floodplains, with 43 percent of one parcel located within a floodplain. The overall sparse population in most of the parcels minimizes the potential for public

interface and subsequent public safety issues. Two parcels located west of the base and two parcels located south of the base, however, contain areas of many inhabited structures, which may increase public safety concerns.

The large urban population in the three-county region of influence containing the base provides a wide range of goods and services. The region includes the Los Angeles metropolitan area, approximately 70 miles to the southwest of the base. Nonagricultural employment is high compared to other regions, which would minimize the likelihood of immigration of project-related workers. The area also has a large number of construction and military personnel, which means new workers will have backgrounds similar to those of the resident population. The economic diversity of the region, as indicated by the number of export-producing industries in the area, is high. Local governments in the region should be able to capture public revenues in the short term in order to address potential expenditure demands. The support community and adjacent metropolitan areas can provide adequate housing for mission-related personnel.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants, except

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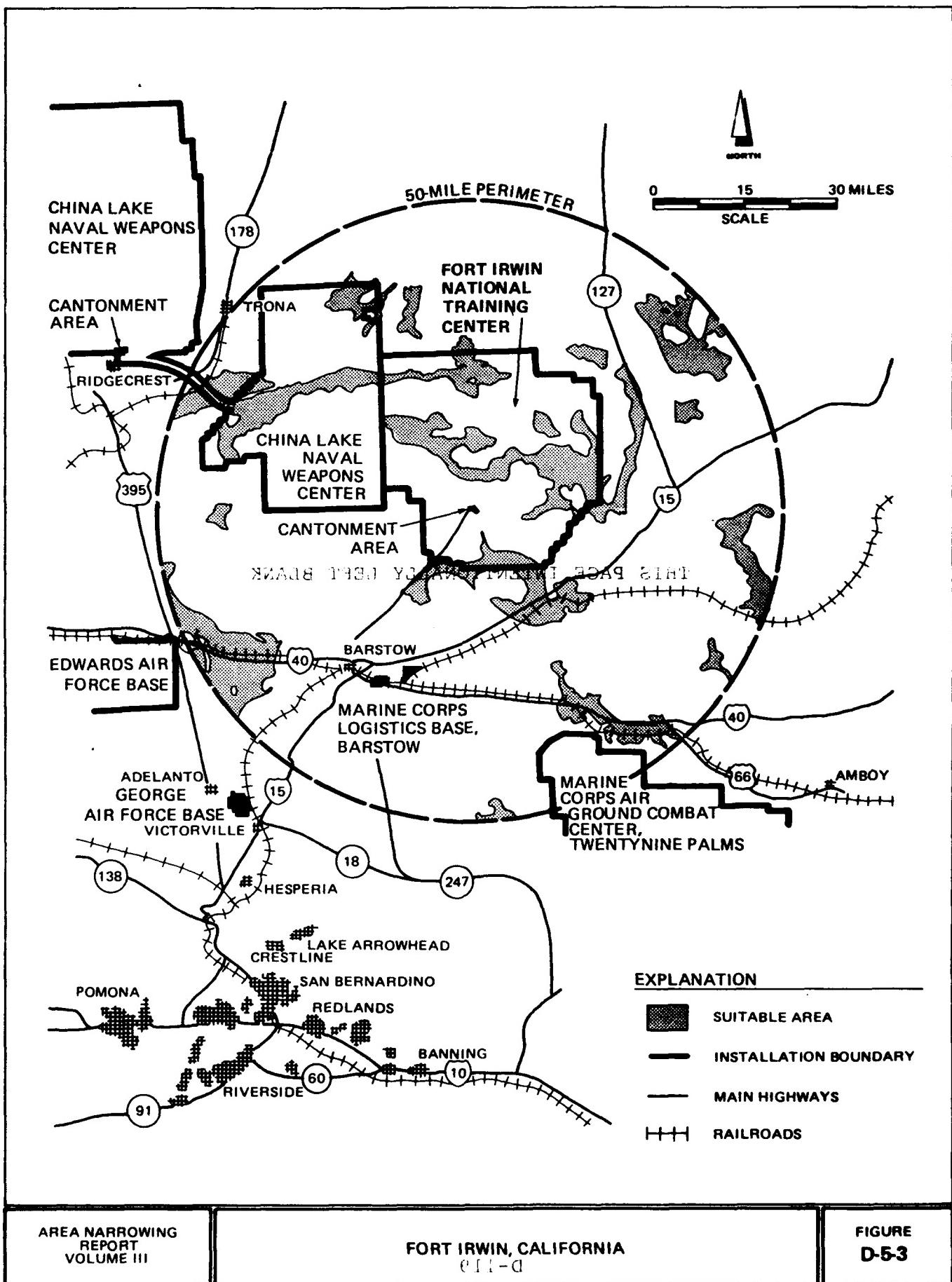
one parcel near Lancaster, which is in nonattainment for at least two pollutants. Activities within the potential Deployment Area would be unlikely to affect any Prevention of Significant Deterioration Class I Areas. No cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based on the cultural history of the region, these types of sites may be discovered if a detailed field survey were performed in the Deployment Area. No Wilderness Study Areas, RARE II areas, or experimental ranges/farms are present within the potential Deployment Area. National/State forest land affect less than 1 percent of the potential Deployment Area.

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D-5.3 Fort Irwin National Training Center, California

After evaluating the alternatives within the complex in relation to each other, Fort Irwin National Training Center (NTC) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the distance to the more feasible deployment areas and the lack of support services in the immediate vicinity.

Fort Irwin NTC is located in south-central California, in the center of the Mojave desert (Figure D-5-3). The installation is approximately 100 miles from the eastern margin of the Los Angeles metropolitan area. Fort Irwin NTC is used by the Army as a training center for evaluation of battalion and brigade level combat skills and readiness. A portion of the base is used by NASA for the Goldstone Space Communication complex.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Fort Irwin NTC would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of 16 suitable area parcels, which total 1,039 square miles. The parcels range in size from 8 to 227 square miles.

Security concerns within the potential Deployment Area would be minimal due to the overall density of inhabited structures. Transportation and utility corridors affect portions of the proposed Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be degraded if the long distance to the nearest support community is considered. Although San Bernardino, 103 road miles south of the base, is the closest community that could provide a wide range of goods and services, the community of Barstow and the Victorville-Hesperia area, located 34 and 78 miles south of the base, respectively, can provide many support services to the base. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base would be dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to the suitable area parcels range from 17 to 80 road miles; the average distance is 50 road miles. These distances could hamper maintenance operations.

Sufficient land to support new facilities, including Weapons Storage Area/Stage Storage Area facilities, for the Hard Silo mission is available at Fort Irwin NTC. The base does not expect a reduction in operations that

would increase the availability of existing facilities for the Hard Silo mission. Ninety-one percent of the land on base is land withdrawn for military use.

The utility infrastructure at Fort Irwin NTC appears adequate for present base operations, with a potential for expansion to meet future demands. Electrical power is presently supplied by Southern California Edison; present system loads average about 95 percent of the 4,980 kilowatt system capacity. Heating is provided by liquified petroleum gas and there is capacity to support a larger demand. The fuel is supplied daily by truck transport from a privately owned plant. The waste-water treatment facility has a capacity of one million gallons-per-day, which is considered only adequate to serve the projected future demand. Solid waste is collected and disposed of in an on-base landfill area projected to have 33 years of remaining capacity. This landfill is considered only adequate to accommodate future base requirements. An extensive storm drainage diversion network extends across the slopes above the perimeter of the cantonment area. Gutters and drainage swales channel runoff from precipitation falling in the cantonment area. Although no surface-water supply is available, it is possible that sufficient ground water is available through direct development for the increased base needs due to

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the Hard Silo mission. Overdrafting of the ground-water basins would continue. Ground water is of poor quality and may require more than conventional treatment prior to domestic use. Expansion of the existing water treatment plant would be required.

Fort Irwin NTC has a limited transportation system. The base has an uninstrumented, compacted sand, 9,500-foot runway located on the Bicycle Lake playa, which is seasonally flooded. The base is not currently served by a rail spur; however, a spur from the Union Pacific main line to the cantonment area has been proposed. Highway access to the base is provided by a two-lane, paved highway that leads to Interstate 15, approximately 31 miles to the south.

Because Fort Irwin NTC is an Army installation, the existing logistic and personnel support systems would need to be augmented to become compatible with Air Force operations.

Fort Irwin NTC has limited supported services, as indicated by the size and distance to the nearest community and the availability of housing. Barstow, with a population of approximately 18,000, is 34 miles from the base and can provide some goods and services for base personnel. The nearest community that can provide a wide range of goods, services, and facilities

is San Bernardino, located approximately 103 miles to the south. On-base housing is barely adequate to meet present requirements, but the housing area has sufficient land available for expansion and additional housing is under construction. Housing availability in Barstow is limited.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints and increase construction and security surveillance costs. Twenty-seven percent of the Deployment Area contains adverse terrain. It is likely that sufficient ground water for system construction and operation will be available in the potential Deployment Area through direct development.

Overdrafting of the ground-water basins from which water is presently withdrawn would continue; however, state and local regulations do not prohibit the practice of overdrafting. Ground-water quality is poor locally and water may require more than conventional treatment prior to some construction use.

Public Impacts: There are minimal land-use conflicts from the Hard Silo system within the Fort Irwin NTC

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Deployment Area. No agricultural land or prime and unique farmland occurs within the potential Deployment Area. None of the Deployment Area contains timberland. Future land-use development plans and trends are not expected to adversely affect the Deployment Area. Approximately 26 percent of the townships within the potential Deployment Area have 20 percent or greater area under energy or mineral claim/lease. No high-value mineral or known energy resources are present in these townships.

A total of 371 square miles of suitable area occur on DoD installations within 50 miles of the base, providing numerous options for Hard Silo deployment on DoD installations. The potential Deployment Area contains 36 percent DoD land. The majority of the remaining suitable area is federally administered (BLM) land, with some areas of private and state land.

Transportation and utility corridors affect approximately 19 percent of the potential Deployment Area, and constrain the siting options available to the Hard Silo system. Water demands from an induced inmigration of workers and their dependents in support of deployment of the Hard Silo system could affect local communities. It is likely that sufficient ground water is available through direct development for the

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individual communities; however, overdrafting of ground-water basins would continue. Ground water may be of poor quality in some areas, requiring more than conventional treatment prior to domestic use. No reliable surface-water source is available.

Natural hazards in the potential Deployment Area are considered minimal. None of the suitable area is located within known 100-year floodplains. Public safety concerns should be minimal because only a few small areas with a low density of inhabited structures are present within the Deployment Area.

The urban population of the region is relatively low implying limited availability of goods and services. Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is average, which means new workers will likely have backgrounds similar to those of the resident population. There is good economic diversity in the region based on the number of export-producing industries. Local governments should be more able to capture tax revenues in the short term in order to address potential expenditure demands. Housing in the region is relatively available, but the nearest community, Barstow, is not large enough to provide sufficient housing units.

Environmental Impacts: Six suitable area parcels in the vicinity of China Lake Naval Weapons Center and Fort Irwin NTC are in nonattainment for at least two major air pollutants. The 10 remaining suitable area parcels are in attainment for all major air pollutants. Activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based upon the cultural history of the region, these types of sites may be discovered if a detailed field survey were performed in the Deployment Area. Wilderness Study Areas and RARE II areas occupy 23 percent of the total potential Deployment Area. Three suitable area parcels contain 100 percent Wilderness Study Areas and/or RARE II areas. None of the suitable area contains experimental ranges/farms or National/State forest land.

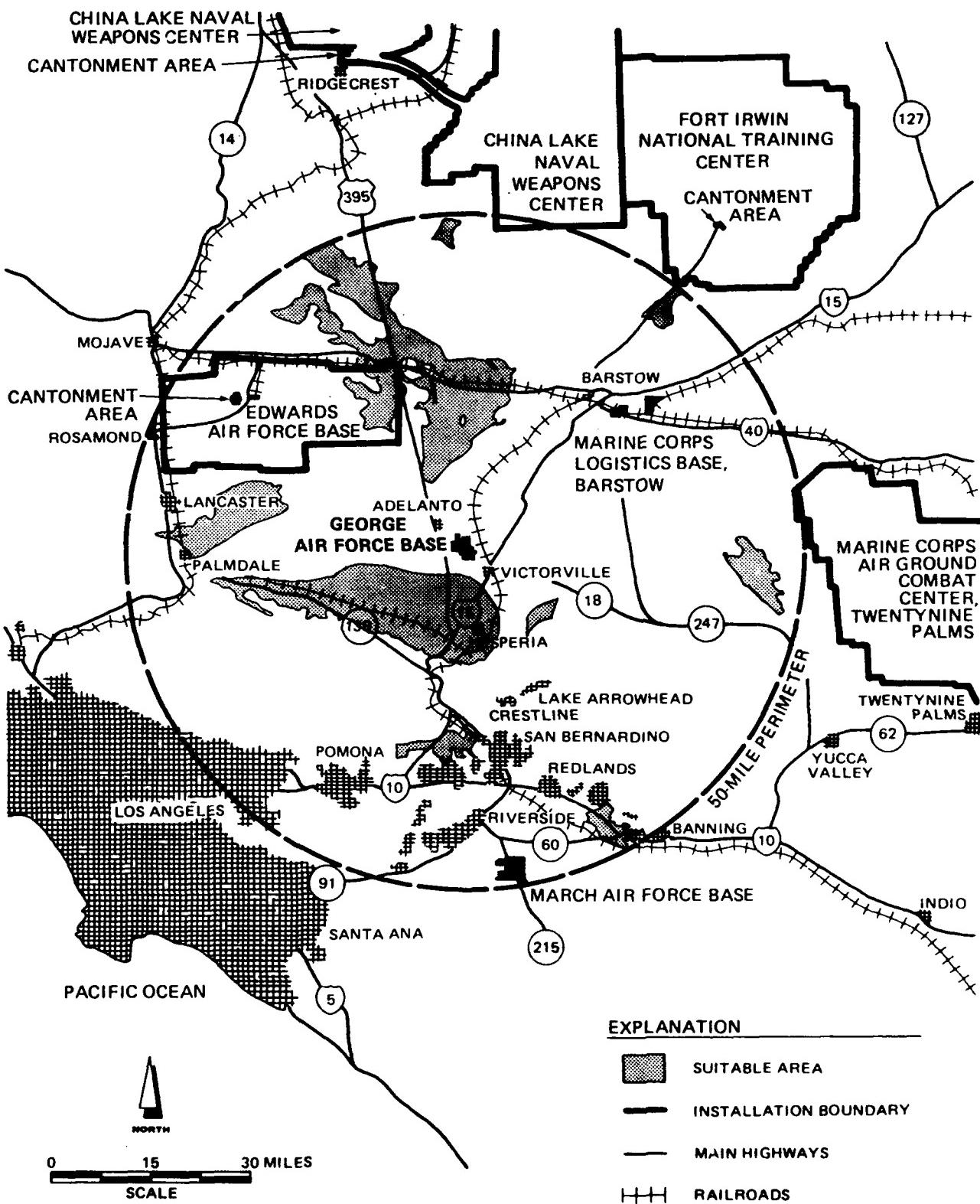
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GEORGE AIR FORCE BASE, CALIFORNIA

FIGURE
D-5-4

D-5.4 George Air Force Base, California

After evaluating the alternatives within the complex in relation to each other, George Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in the determination were the distances to potential deployment areas, limited land available at the base for new facilities, and the limited support services available in the immediate vicinity.

George Air Force Base is located in south-central California, on the western margin of the Mojave Desert (Figure D-5-4). The installation is approximately 46 miles north of San Bernardino. The base has an existing Air Force Tactical Air Command (TAC) training mission.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of George AFB would provide numerous options for siting the Hard Silo system. The potential Deployment Area encompasses 894 square miles distributed among nine suitable area parcels. These parcels range in size from 8 to 365 square miles.

Security concerns within the potential Deployment Area would be minimal due to the overall low density of

inhabited structures. There are, however, isolated locations within the Deployment Area that have a high density of inhabited structures and pose potential security concerns. Transportation and utility corridors affect portions of the potential Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be degraded by the distance (46 road miles) to San Bernardino, the nearest community that could provide a wide range of goods and services. The small community of Adelanto, adjacent to the base, has very limited services. The Victorville-Hesperia area can provide some goods and services. The accessibility to base maintenance facilities from the potential Deployment Area is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to suitable area parcels from the base range from 19 to 65 road miles and average 49 road miles. These distances could hamper maintenance operations.

The base does not anticipate a reduction in operations that would increase the availability of existing facilities for the Hard Silo mission. George AFB has sufficient land available for new facilities to support the Hard Silo mission. However, Weapons Storage

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Area/Stage Storage Area facilities for the Hard Silo mission can only be accommodated in the southern portion of the base. Off-base expansion is feasible but limited. Presently, 95 percent of the land on base is DoD fee-owned or donated.

The utility infrastructure at George AFB is adequate for present base operations and has potential for expansion of capacity to meet future requirements. Electrical power is supplied by Southern California Edison; present base power usage is approximately two-thirds of system capacity. Natural gas is the principal heating fuel and is supplied by the Southwest Gas Company. Capacity is adequate for present demands. A new waste-water treatment facility adjacent to the base is co-owned and co-used with the Victor Valley Waste-Water Reclamation Authority. Present base usage is approximately 90 percent of entitlement, but base allotments can be increased to meet future demands. Solid waste disposal facilities are believed to be adequate for present and projected base demands. The base storm drainage system appears adequate. Runoff is drained by underground pipe drains, street gutters, and open ditches to the Mojave River, located east of the base. Ground-water supplies are available through direct development on base. Overdrafting of the ground-water basin would continue; however, state

regulations do not presently prohibit overdrafting. Ground water may be of poor quality locally and may require more than conventional treatment prior to domestic use. No surface-water supply is available.

George AFB is served by a good transportation system. The base has two instrumented concrete runways with lengths of 10,050 and 9,116 feet. Highway access to the base is provided by a county road that passes the main gate and leads to Interstate 15, located 3 miles to the east, and U.S. Highway 395, located 2 miles to the west. An unused rail spur runs 5 miles from the main line of the Santa Fe Railroad to the cantonment area; however, the rails have been paved over for roads and parking areas within the cantonment area.

Because George AFB is an Air Force installation, the existing personnel and logistic support systems would be compatible with the Hard Silo mission.

George AFB has fairly good support services, as indicated by the size of a support community and the availability of housing. The San Bernardino urban area, with a population over 117,500, approximately 46 road miles south of the base, can provide a wide range of goods and services. The Victorville-Hesperia area, with a population of over 30,000, is the closest urban area, but the area cannot provide a wide range of goods

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and services. On-base housing is adequate for the existing mission, but would require expansion to accommodate the Hard Silo mission. Housing in the surrounding area is more than adequate for present operations, but housing within a reasonable distance of the base, at moderate rental rates, may be limited.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain conditions, which affect 13 percent of the potential Deployment Area, may impose some system siting constraints and can increase construction and security surveillance costs. The adverse terrain occurs primarily within the two largest parcels. It is likely that ground water will be available in the potential Deployment Area through direct development. Overdrafting of the ground-water basins would continue. Ground-water quality is locally poor and may require more than conventional treatment prior to construction use. Surface water, from local and imported sources, is potentially available in the suitable area parcels located south of the base. Surface-water quality is good.

Public Impacts: There is some potential for land-use conflicts from deployment of the Hard Silo system

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within the potential George AFB Deployment Area. Approximately 6 percent of the potential Deployment Area contains agricultural land and 1 percent is classified as prime and unique farmland. No timberland is present within the potential Deployment Area. Approximately 18 percent of the townships within the potential Deployment Area have 20 percent or greater area under energy or mineral claim/lease. High-value mineral resources occur in only 1 percent of the townships and known energy resources do not occur. Future land use development plans and trends may adversely affect portions of the potential Deployment Area.

A total of 43 square miles of on-installation suitable area occurs within 50 miles of George AFB and provides few options for Hard Silo deployment on DoD installations. Five percent of the potential Deployment Area is located on DoD land; the majority of the potential Deployment Area is privately owned land, with some federally administered (BLM) land.

Transportation and utility corridors affect approximately 35 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. The increased water demand of the induced work force and their families will have a

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minimal effect on water availability in the support communities. Ground water could be obtained by direct development or purchase/transfer of existing water rights but overdrafting of the ground-water basin would continue. The purchase of surface water from the California Aqueduct System is also feasible. Water would not require more than normal treatment prior to domestic use.

Natural hazards in the Deployment Area are considered minimal. Only 4 percent of the potential Deployment Area is located within known 100-year floodplains; this area is concentrated within two of the smaller parcels. Due to the overall low density of inhabited structures in the Deployment Area, public safety concerns would be minimal.

The potential socioeconomic concerns arising from Hard Silo system deployment at George AFB would be increased if the relatively small urban areas of Victorville and Hesperia were to absorb the influx of support personnel and dependents. The region of influence (including Los Angeles County), has a very high urban population and can provide a more than adequate amount of goods and services. It is likely that the San Bernardino area would absorb some of the population influx in spite of the rather long commuting

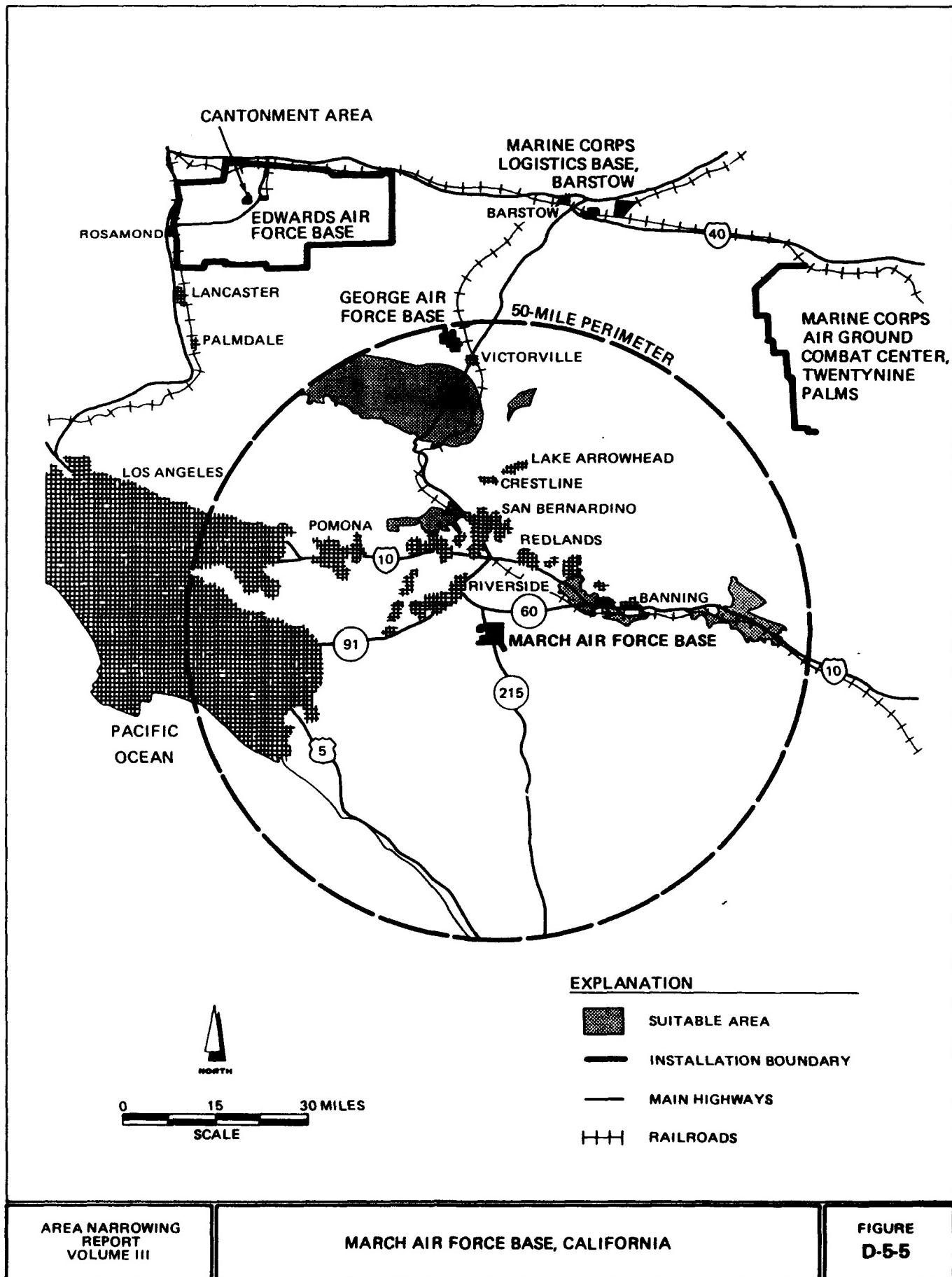
distance to the base. Nonagricultural employment in the region is sufficiently high to avoid the consequences of inmigration of project-related workers. The region has a large number of construction and military workers, which would minimize inmigration of workers with backgrounds dissimilar to those of the resident population. The economic diversity of the region is high as indicated by the number of export-producing industries. Local governments throughout the region should be able to capture tax revenues in the short term if needed to address potential expenditure demands. Although there are many available housing units in the region, housing availability near the base may not be as readily available.

Environmental Impacts: Four suitable area parcels near Rialto, Banning, and Edwards AFB are in non-attainment for at least two major air pollutants. In addition, deployment activities within the parcels near Rialto and Banning would be likely to affect Prevention of Significant Deterioration (PSD) Class I areas. The five remaining parcels are in attainment for all major air pollutants and activities within these parcels would be unlikely to affect any PSD Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the potential

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Deployment Area. Based on the cultural history of the region, these types of cultural resource sites may be discovered if a detailed field survey were performed in the potential Deployment Area. Wilderness Study Areas, RARE II areas, and National/State forests occur in less than 1 percent of the potential Deployment Area. Experimental ranges/farms do not occur within the potential Deployment Area.

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D-5.5 March Air Force Base, California

After evaluating the alternatives within the complex in relation to each other, March Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the presence of major transportation and utility corridors on potential deployment areas and the separation of the base and portions of the potential Deployment Area by a major mountain range.

March AFB is located in southern California, 5 miles southeast of the city of Riverside (Figure D-5-5). The base supports the 22nd Air Refueling Wing of the Strategic Air Command.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of March AFB would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of five suitable area parcels, which total 387 square miles. Four of the parcels range in size from 10 to 61 square miles; the fifth parcel is 257 square miles in size.

Security concerns within the potential Deployment Area would be high because of the overall low to high

density of inhabited structures. Of particular concern are two parcels, one surrounding the city of Banning and one to the east of Banning. The entire area of each of these parcels contains a combination of high and low density inhabited structures. The distribution of transportation and utility corridors affects a large portion of the potential Deployment Area, causing additional security concerns.

System Operability: The efficiency of the Main Operating Base activities would be enhanced by the proximity of the support community of Riverside (5 miles). The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the base. Distances to parcel areas from the base range from 26 to 53 road miles and average 39 road miles. These distances could hamper maintenance operations.

The base does not expect a mission loss that would increase the availability of existing facilities for the Hard Silo mission. Sufficient land is available on base for new support facilities, including Weapons Storage Area/Stage Storage Area facilities. One hundred percent of the land on base is DoD fee owned.

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The utility infrastructure at March AFB is adequate for present base operations, with potential for expansion to meet future demands. Electrical power is presently supplied by Southern California Edison. Capacity is more than adequate to supply present base needs and increased demands. Natural gas, the primary fuel used for heating at the base, is presently supplied by Southern California Gas. The gas supply is adequate for present and increased demands. Waste-water treatment facilities on base are adequate to meet present demands, but additional use may exceed the present capacity of the facilities. Solid waste is collected by private contractor and disposed of in an off-base landfill with adequate capacity to meet new needs. The base storm drainage system is a combination of improved and unimproved open ditches with some underground storm drains. The present drainage system is adequate to convey major storm flows off base. Additional surface water could be purchased from the existing water supplier to support the on-base needs of the Hard Silo mission. Significant expansion of existing water supply facilities would be required, however. Water would not require more than conventional treatment prior to domestic use. Ground water could be developed, however overdrafting would continue. Ground water is locally of poor quality and

may require more than conventional treatment prior to domestic use.

March AFB is served by an excellent transportation system. The base has two instrumented runways: one 13,000 feet long and the other 6,980 feet long. State Highway 215 passes through March AFB. Primary base access is via an arterial on the northern perimeter of the base. Rail service is provided by the Santa Fe Railroad, which bisects March AFB in a north-south direction. Two infrequently used rail spurs serve the base.

Because March AFB is an Air Force installation under Strategic Air Command, the existing logistical and personnel support system would be compatible with the Hard Silo mission.

The support services for March AFB are adequate, as indicated by the availability of housing and the proximity to a support community. On-base housing is inadequate for the existing mission needs but land is available for expansion. Off-base housing in the nearby community of Riverside, and in other surrounding communities is available, but rental rates and housing prices are high. The city of Riverside (population about 171,000) is the nearest community capable of providing a wide range of goods and services

for base personnel.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed through the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints and increase constructions and security surveillance costs. Twelve percent of the potential Deployment Area contains adverse terrain. It is likely that surface water will be available through purchase in most of the potential Deployment Area for system construction and operation. Surface water would not require more than normal treatment. Ground water could be developed; however, the quality is poor in some areas and the water would require more than conventional treatment prior to some construction uses.

Public Impacts: The potential for land-use conflicts in the potential Deployment Area is low. Agricultural land is present in four parcels and covers about 5 percent of the potential Deployment Area. Less than 1 percent of the Deployment Area is classified as prime and unique farmland. No timberlands are present within the potential Deployment Area. Future land use development and trends may adversely affect a large portion of the of the potential Deployment Area.

Presently, 13 percent of the townships in the potential Deployment Area have 20 percent or more area under energy : mineral claim/lease. However, none of these townships have known energy or high value mineral resource areas.

The lack of suitable area parcels on DoD/DoE installations within 50 miles of March AFB precludes any potential for Hard Silo deployment on DoD/DoE installations. The potential Deployment Area occurs on private land with a very small amount of area on federally administered (BLM) land.

Transportation and utility corridors affect 52 percent of the Deployment Area, decreasing siting options for the Hard Silo system. A minimal effect on water availability in the support community is likely to occur due to the increase in population from project-related workers and their dependents. Both surface and ground water are available to the support community. Surface water quality is such that it does not require more than conventional treatment prior to domestic use, but ground water is of poor quality in some areas and may require more than conventional treatment.

Natural hazards within the potential Deployment Area are considered minimal. Portions of four parcels are

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located within known 100-year floodplains, but affect only 9 percent of the Deployment Area. Public safety concerns within the potential Deployment Area are considered high because almost all parcels have areas of low to high density inhabited structures.

The large urban population in the region of influence containing the base provides a wide range of goods and services, which would minimize the potential for social and economic concerns arising from Hard Silo system deployment. Nonagricultural employment is high, which minimizes the likelihood of inmigration of project related workers. The area has a large number of construction and military personnel, which would minimize the likelihood of an influx of workers with backgrounds dissimilar to those of the resident population. The economic diversity of the region is high, as indicated by the number of export-producing industries in the region. Local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the support community and in the region is high.

Environmental Impacts: Three of the five suitable area parcels are in nonattainment for at least two major air pollutants. In addition, if selected for

deployment, activities in these parcels would be likely to affect Prevention of Significant Deterioration (PSD) Class I areas. The two remaining parcels are in attainment for all major air pollutants and activities within these parcels would be unlikely to affect any PSD Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the Deployment Area. Based on the cultural history of the region, these types of sites may be discovered if a detailed field survey were performed in the potential Deployment Area. No Wilderness Study Areas, RARE II areas, or experimental ranges/farms, are present within the Deployment Area. One percent of the potential Deployment Area is within National/State Forest land.

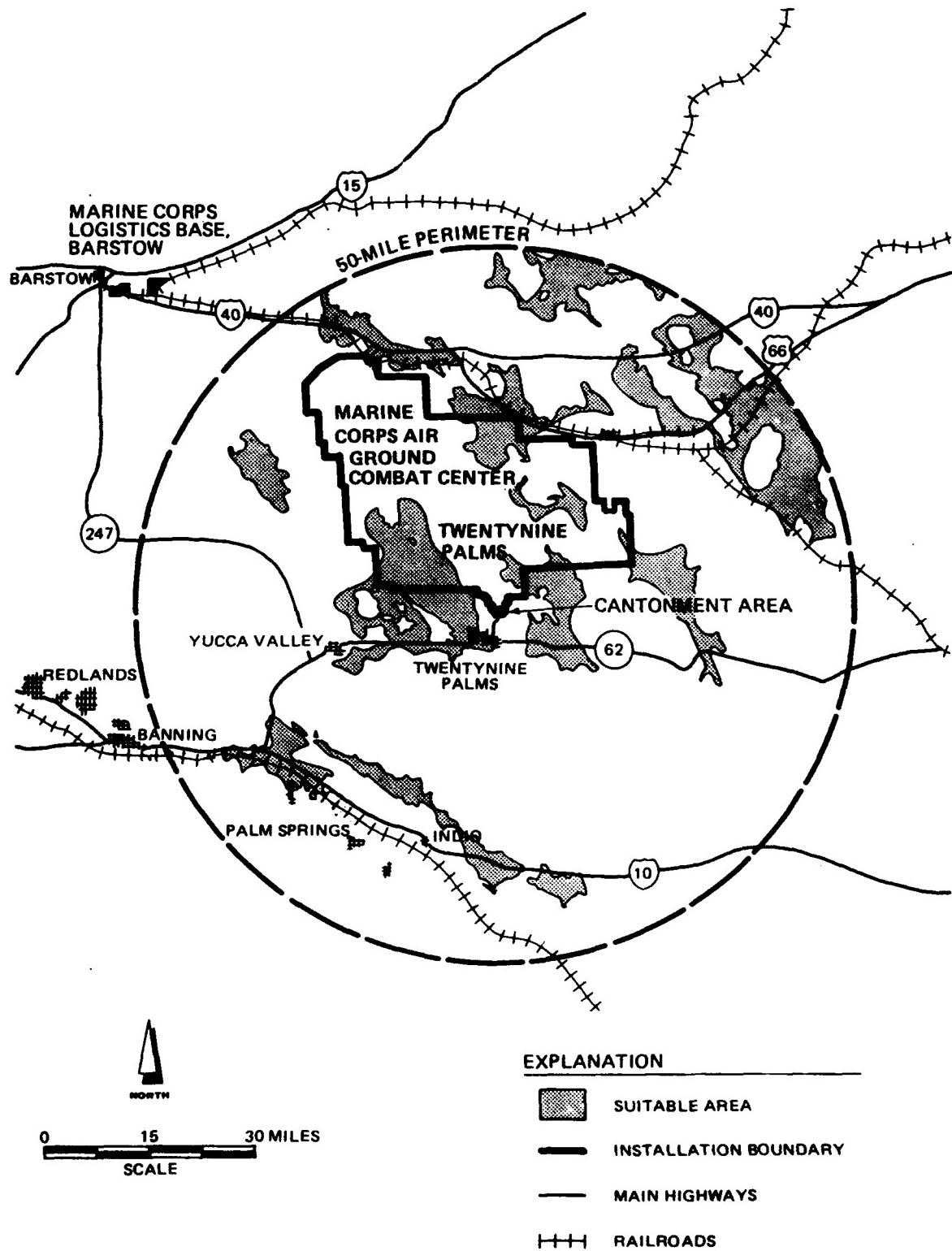
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MARINE CORPS AIR GROUND COMBAT CENTER,
TWENTYNINE PALMS, CALIFORNIA

FIGURE
D-5-6

D-5.6 Marine Corps Air Ground Combat Center,
Twentynine Palms, California

After evaluating the alternatives within the complex in relation to each other, Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. The major influences in this determination were the limited transportation system and support services available in the immediate vicinity.

MCAGCC is located in south-central California, in the center of the Mojave Desert, approximately 54 miles north of Palm Springs (Figure D-5-6). The base serves to administer, conduct, support, and evaluate combined arms combat training using all conventional weapons, and includes live ordnance training.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of MCAGCC would provide numerous options for siting the Hard Silo system. The potential Deployment Area encompasses 1,158 square miles distributed among 12 suitable area parcels. These parcels range in size from 19 to 286 square miles.

Security concerns within the Deployment Area would be minimal due to the overall low density of inhabited

structures. Existing transportation and utility corridors affect portions of the potential Deployment Area causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be degraded by the lack of a nearby community that could provide a wide range of goods and services. Palm Springs, approximately 54 miles to the south, is the nearest community with a wide range of goods and services. The nearby communities of Twentynine Palms and Yucca Valley have small populations and limited goods and services. The accessibility of the potential Deployment Area to base maintenance facilities is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to suitable area parcels from the base range from 17 to 83 road miles and average 47 road miles. These distances could hamper maintenance operations.

MCAGCC has sufficient land available for new facilities, including Weapons Storage Area/Stage Storage Area facilities, to support the Hard Silo mission. The base is not anticipating a mission change that would increase the availability of existing facilities for the Hard Silo mission. All of the land on base is either DoD fee owned or land withdrawn for

military use.

The utility infrastructure at MCAGCC is adequate for present base operations with a high potential for expanding capacity to meet future demands. Electrical power is supplied by Southern California Edison. The system capacity is more than adequate to supply present base needs and could handle as much as double the existing demand. Natural gas is used for heating and present demand is approximately one-half the maximum capacity. Waste-water treatment facilities are adequate to meet present demand but may require upgrading to accommodate future growth. Solid waste is collected by private contractor and disposed of in the San Bernardino County landfill, which has a remaining life of 11 years. The storm drainage system is inadequate to handle major storm runoff; flash flooding has occurred on base. No surface-water supply is available, but it is likely that sufficient ground water may be available to meet on-base project demands through direct development. Overdrafting of the ground-water basin would continue. Ground water is of poor quality locally and may require more than conventional treatment prior to domestic use.

MCAGCC has a very limited transportation system. The base has a temporary aluminum mat runway that is closed

periodically for repair. A permanent, 10,000-foot runway has been proposed for construction starting in 1990. Base access is provided by local city streets leading to State Highway 62. These streets are subject to occasional flash flooding. There is no rail service to the base, but a Santa Fe-Southern Pacific line runs adjacent to the northern base boundary.

Because MCAGCC is a Marine Corps installation, the existing personnel and logistic support systems would need to be augmented to become compatible with the Air Force operations.

MCAGCC has very limited support services, as indicated by the distance to a support community and the availability of housing. The community of Twentynine Palms, with a population of approximately 11,000, is within a few miles of the cantonment area, but the city provides only limited goods and services. The nearest community with a full range of goods, services, and facilities is Palm Springs, 54 miles to the south, with a population of approximately 66,000. The base has a large number of housing units but occupancy rates average 99 percent. Off-base housing rates are reasonable, but many units require upgrading and the number of available units is limited.

System Practicability: Construction aggregate is available through purchase and/or direct development.

Aggregate sources are distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints and increase construction and security surveillance costs. Eight percent of the Deployment Area contains adverse terrain. Sufficient ground water to support system construction is likely available in the potential Deployment Area through direct development; however, overdrafting of ground-water basins would continue. Ground water is locally of poor quality and may require more than conventional treatment prior to construction use. Surface water may be available in some parcels located south of MCAGCC.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the potential Deployment Area is minimal. Less than 1 percent agricultural land, less than 1 percent prime and unique farmland, and no timberlands are present within the potential Deployment Area. Presently, approximately 12 percent of the townships in the potential Deployment Area have 20 percent or greater area under energy or mineral claim/lease. No high value mineral resource areas are present but known energy resources occur in 3 percent of these townships. Future land use development plans and trends are not expected to adversely affect any of the suitable area parcels.

MCAGCC contains 186 square miles of suitable area, or 16 percent of the potential Deployment Area, on-installation. No additional suitable area occurs on-installation within 50 miles of the base. This amount of suitable area provides some options for Hard Silo deployment on DoD installation within 50 miles of MCAGCC. The majority of the potential Deployment Area is federally administered (BLM) and private land.

Transportation and utility corridors affect approximately 26 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. Water resource demand from the induced work force and their dependents could affect the surrounding communities. Although ground water is likely available, overdrafting of the ground-water basin would continue. Ground water may be of poor quality locally and may require more than conventional treatment prior to domestic use.

Natural hazards in the potential Deployment Area are considered minimal. Only 2 percent of the total suitable area lies within identified 100-year floodplains, and this area occurs primarily in one parcel. The general lack of inhabited structures in the parcels will minimize public safety concerns within the potential Deployment Area.

Deployment of the Hard Silo system at MCAGCC could raise social and economic concerns in the relatively small communities of Twentynine Palms and Yucca Valley, if they were to absorb the influx of support personnel and dependents. These towns are the largest nearby population centers. The majority of the regional population is concentrated in the vicinity of San Bernardino, over 70 miles from the base.

Nonagricultural employment in the region is moderate,

which indicates that there is not likely to be an

increase of immigration of project-related workers.

Regional employment in the construction and military

sectors is relatively high, which would minimize the

likelihood of an influx of workers with backgrounds

dissimilar to the resident population. The economic

diversity of the region is high, based on the number of

export-producing industries. The local governments in

the region are moderately able to capture tax revenues

in the short run to address potential expenditure

demands. The number of available housing units within

the immediate Twentynine Palms area is limited,

although housing availability in the region is

relatively high.

Environmental Impacts: The majority of the potential Deployment Area is in attainment for all major air pollutants and activities within these suitable area

parcels would be unlikely to affect any Prevention of Significant Deterioration (PSD) Class I areas. However, activities within two suitable area parcels near Palm Springs would be likely to affect several PSD Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based on the cultural history of the region, these types of sites may be discovered if a detailed field survey were performed in the potential Deployment Area. Wilderness Study Areas and RARE II areas occur in approximately 31 percent of the potential Deployment Area. No experimental ranges/farms or National/State forest land are presently located within the suitable area.

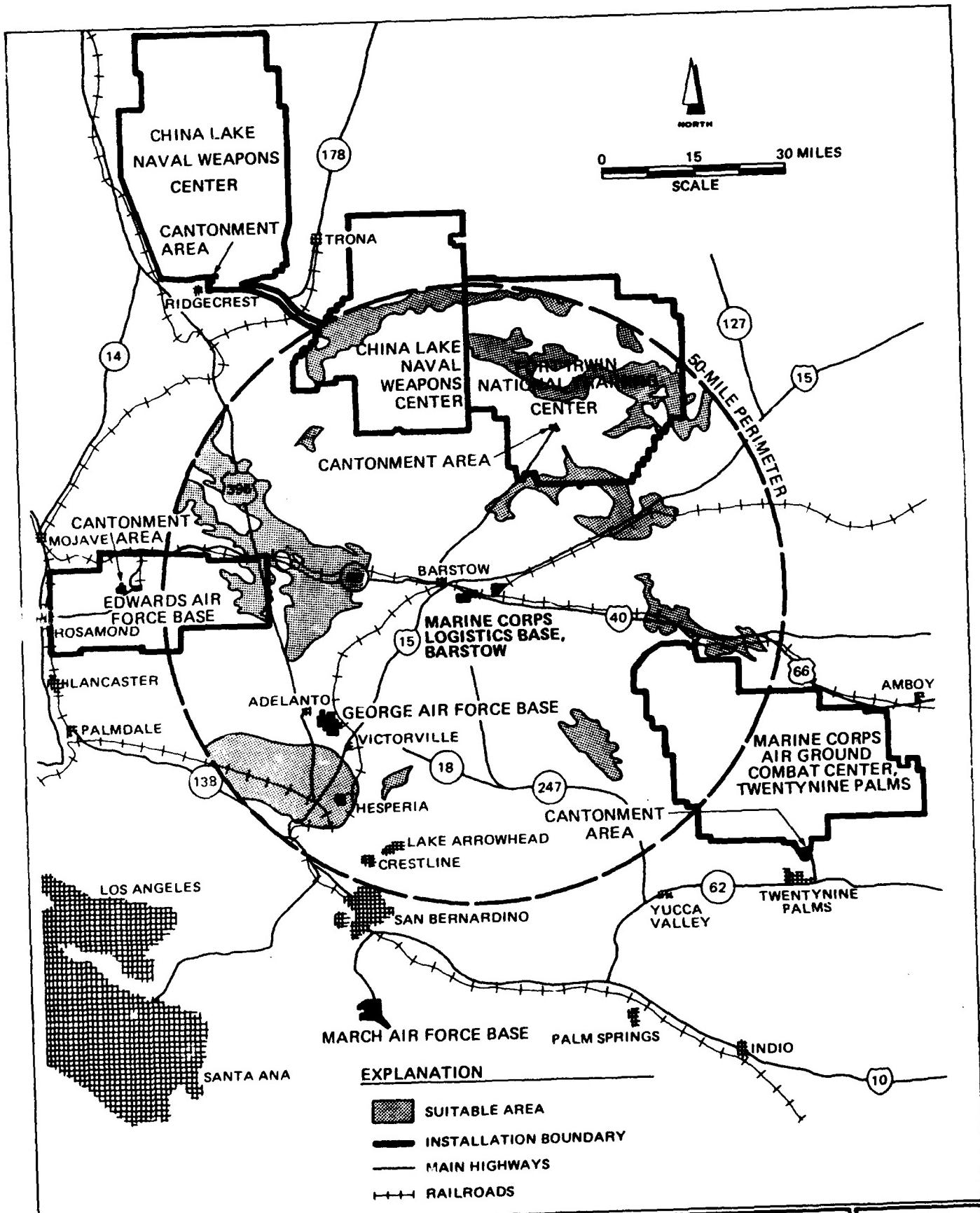
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MARINE CORPS LOGISTICS BASE, BARSTOW, CALIFORNIA

FIGURE
D-5-7

D-5.7 Marine Corps Logistics Base, Barstow, California

After evaluating the alternatives within the complex in relation to each other, Marine Corps Logistics Base (MCLB) Barstow was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the distances to potential deployment areas, the lack of air transportation facilities, limited land available on the base for new facilities and limited support services available in the immediate vicinity.

Barstow MCLB is located in south-central California, about 4 miles east of Barstow and 75 miles northeast of San Bernardino (Figure D-5-7). The base provides equipment maintenance and repair support for the Marine Corps.

System Effectiveness: The size and distribution of parcels within 50 radial miles of Barstow MCLB would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of 1,146 square miles distributed among ten suitable area parcels that range in size from 8 to 355 square miles.

Security concerns within the potential Deployment Area would be minimal because of the overall low density of

inhabited structures. Eight of the ten parcels have few inhabited structures. Two parcels have a low density of inhabited structures distributed over a large area, posing greater siting and security concerns in these areas. Transportation and utility corridors affect portions of the Deployment Area, causing additional security concerns.

System Operability: The efficiency of the Main Operating Base activities would be degraded by the long travel distance (75 road miles) to a community (San Bernardino) that could supply a wide range of goods and services. Barstow, the nearest community, has relatively few support services in comparison. The Victorville-Hesperia area, approximately 36 miles to the south, can supply some services. The accessibility to maintenance facilities is dependent upon the final parcel(s) selected for siting and its distance from the base. Distances to the suitable area parcels from the base range from 37 to 75 road miles and average 52 road miles. These distances could hamper maintenance operations.

The base is not anticipating a mission loss that would increase the availability of existing facilities for the Hard Silo mission. Available land for new support facilities, as well as Weapons Storage Area/Stage

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Storage Area facilities, is constrained. Available land is divided between two widely separated areas that compose the base; however, expansion off base is feasible. On-base land is 100 percent DoD fee owned.

The utility infrastructure at MCLB Barstow appears adequate for present base operations, with potential for increased capacity of most utilities. Electrical power is presently supplied by Southern California Edison and is adequate to meet present base demands. Gas and oil for heating are provided by the Southwest Gas Corporation. The expansion capacity of electrical power and heating systems is uncertain; however, the proximity to a nearby community suggests that there is potential for expansion. Dual waste-water treatment facilities serve the base and have capacities of 3 million and 1.5 million gallons-per-day. The treatment facilities are adequate for current demands, but may not have excess capacity. Domestic and industrial solid wastes are collected and disposed of on the base at a 29-acre landfill site believed to be adequate for present and projected base demands, with possible expansion potential. The base storm drainage system is presently inadequate, as evidenced by soil and road washouts during infrequent seasonal storms. Although no surface water supply is available, there is potential for new development or additional purchase

from existing ground-water sources to meet the base water needs of the Hard Silo mission. Water may be of poor quality locally and may require more than conventional treatment prior to domestic use.

The base is served by a limited transportation system due to the lack of an on-base airfield. The only airfield in the area is a 6,400-foot runway located at the Barstow-Daggett County Airport, located approximately 4 miles southeast of the base. Highway access is provided by Interstate Highways 15, to the north, and 40, which bisects the base. Rail service that runs through the northern portion of the base and along the eastern edge of the base is owned by the Santa Fe and Union Pacific railroads, respectively. The base is serviced by 23 miles of spurs.

Existing Marine Corps personnel and logistic support systems at MCLB Barstow would need to be augmented to become compatible with Air Force operations.

MCLB Barstow has very limited support services, as indicated by the availability of housing and the distance to a support community. Housing availability on the base and in the surrounding communities is limited. Barstow, the nearest community, has some support services and facilities for base personnel. However, San Bernardino, approximately 75 miles south

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of the base, is the closest support community that could provide a wide range of goods, services, and facilities to support the Hard Silo mission.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints and increase construction and security surveillance costs. Adverse terrain occurs in 21 percent of the potential Deployment Area. Sufficient ground water for system construction and operation will be available in the potential Deployment Area via direct development. Overdrafting of ground-water basins may be necessary but this practice is not currently prohibited by local regulations. Ground-water quality is poor in some areas and may require more than conventional treatment prior to construction use.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the potential MCLB Barstow Deployment Area is low. Less than 1 percent of the potential Deployment Area is under agricultural development, and none of the potential Deployment Area is classified as prime and

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unique farmland. Timberland does not occur within the potential Deployment Area. Approximately 24 percent of the townships in the potential Deployment Area have 20 percent or greater area under energy or mineral claim/lease. High value mineral resources occur in only 3 percent of these townships and known energy resources do not occur in any of the townships. Future land-use development plans and trends are not expected to adversely affect the Deployment Area.

The 353 square miles of suitable area on DoD installations within 50 miles of Barstow MCLB, or 31 percent of the potential Deployment Area, provide numerous options for Hard Silo deployment on DoD installations. The majority of the Deployment Area is federally administered (BLM) land with some privately owned land.

Transportation and utility corridors affect approximately 33 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. The water demand from the project-induced work force and their families on the support community could affect the water availability in the area. Although sufficient ground water may be available through new development or additional purchase of existing supplies, overdrafting would

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continue. Also, water quality is locally poor, requiring more than conventional treatment prior to domestic use.

Natural hazards in the Deployment Area are considered minimal. Less than 1 percent of the suitable area is located within identified 100-year floodplains. Due to the general lack of inhabited structures in the Deployment Area, public safety concerns will be minimal.

The urban population of the region is relatively high, indicating that it can provide many goods and services. Nonagricultural employment is also high, which decreases the likelihood of inmigration of project-related workers. Enough construction workers and military personnel are already in the region to ensure that any new workers will likely have backgrounds similar to those of the existing population. Compared to other areas examined, the region has the highest number of export-producing industries, which indicates considerable economic diversity. Local governments throughout the region have been able to capture tax revenues in the short term and could continue to address potential expenditure demands. A considerable amount of housing is also available. Although the regional situation is

good, the nearest community, Barstow, cannot provide all the goods, services, and housing needed.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based on the cultural history of the region these types of cultural resource sites may be discovered if a detailed field survey were performed in the Deployment Area. Wilderness Study Areas and RARE II areas affect 2 percent of the potential Deployment Area. None of the potential Deployment Area contains experimental ranges/farms. Less than one percent of the Deployment Area contains National/State forest land.

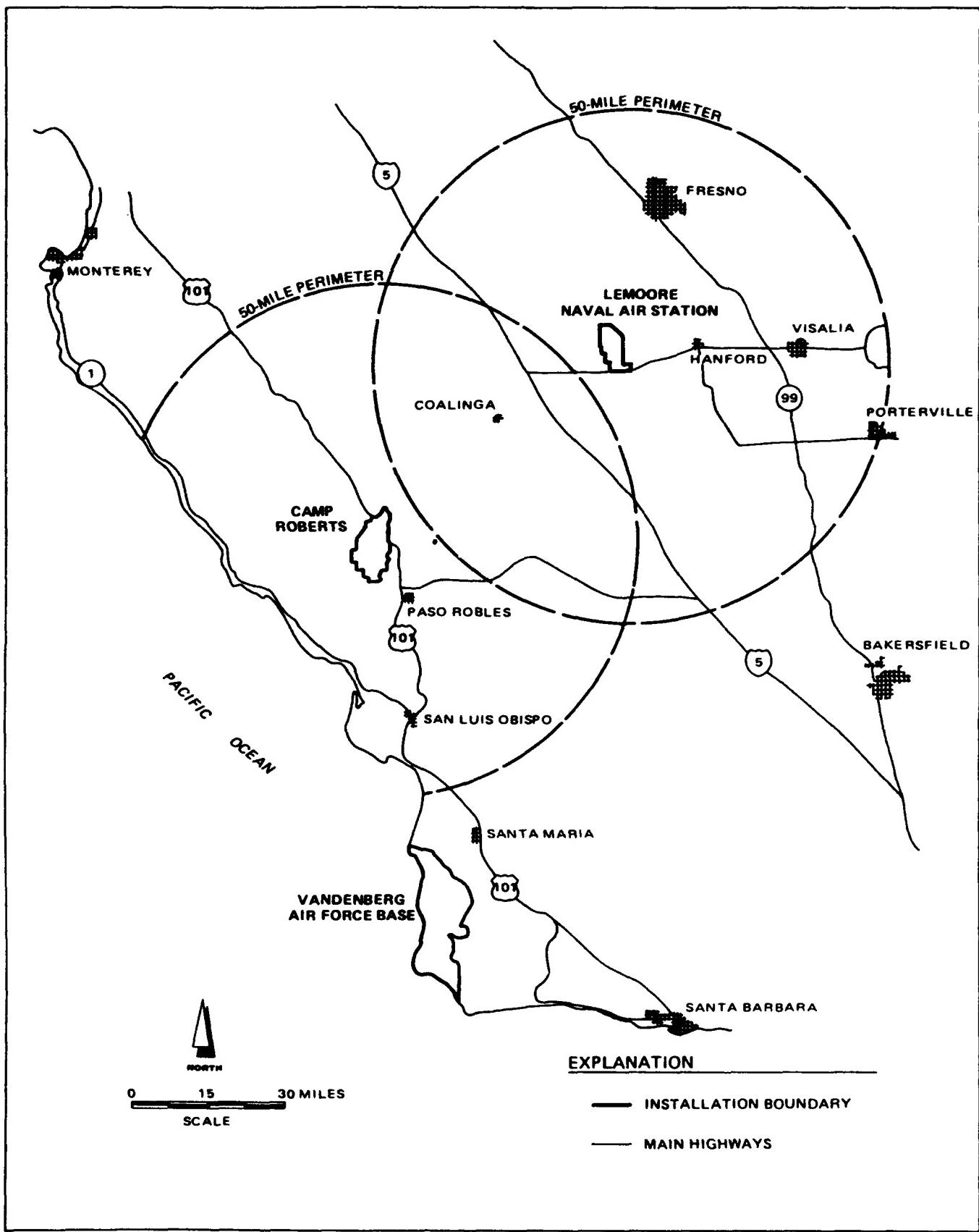
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CALIFORNIA - WEST-CENTRAL COMPLEX

FIGURE
D-6

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D-6 California - West-Central Complex

Following application of the Exclusionary Criteria, Camp Roberts and Lemoore Naval Air Station were grouped into a complex (Figure D-6).

Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of Camp Roberts.

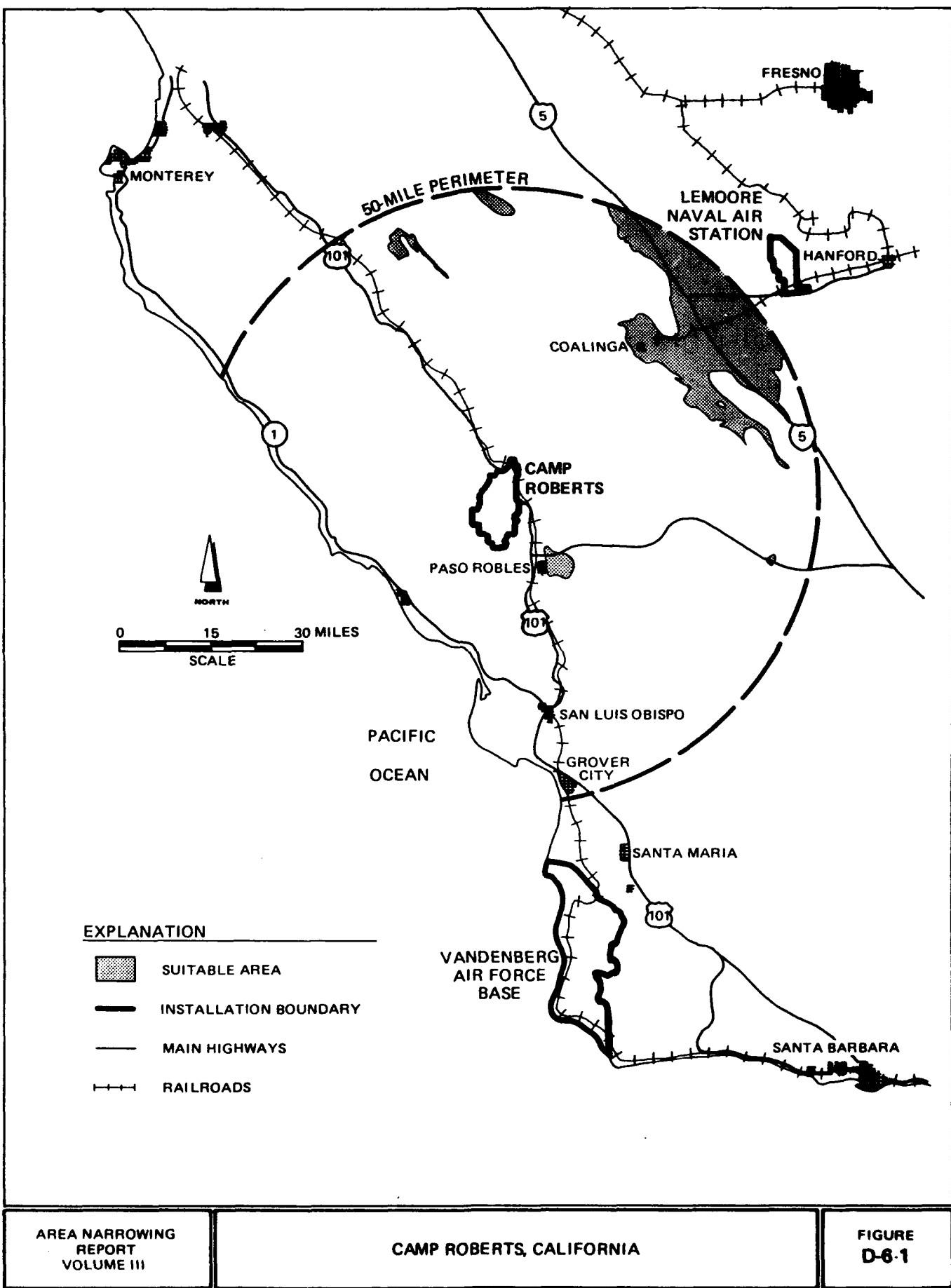
Application of the Evaluative Criteria to the 14 complexes resulted in the elimination of Lemoore NAS and its potential Deployment Area. The major factors in these determinations were:

Camp Roberts - size of potential deployment areas, their distance from the potential Main Operating Base, and the amount of land dissected by transportation and utility corridors; and the intense agricultural development on much of the Deployment Area.

Lemoore Naval Air Station - dissection of the potential deployment areas by transportation and utility corridors and the limited support services available in the immediate vicinity.

The following sections elaborate on the performance of each potential Main Operating Base and its associated potential Deployment Area with regard to the Evaluative Criteria.

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D-6.1 Camp Roberts, California

After evaluating the alternatives within the complex in relation to each other, Camp Roberts was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the size of potential deployment areas, their distance from the base, the area dissected by utility and transportation corridors, and the intense agricultural development on much of the potential Deployment Area.

Camp Roberts is located in central California, approximately 10 miles north of Paso Robles and 38 miles north of San Luis Obispo (Figure D-6-1). The base is operated by the California National Guard as a training, administrative, and logistical area for reserves of the Sixth Army and other services.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Camp Roberts would provide limited options for siting the Hard Silo system. The potential Deployment Area consists of four parcels of suitable area, which total 478 square miles. Three parcels range in size from 14 to 15 square miles. The fourth parcel is 434 square miles in size and is located northeast of the base.

Large areas of low density inhabited structures within the potential Deployment Area would cause minimal security concerns. Population centers within the largest parcel contain small areas of high density inhabited structures. Transportation and utility corridors affect a large portion of the proposed Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be degraded by the long distance (38 road miles) to San Luis Obispo, the nearest community capable of providing a wide range of goods and services. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected and its distance from the base. Distances to parcels from the base range from 8 to 88 road miles and average 60 road miles. These distances could hamper maintenance operations.

The base does not anticipate a reduction in its future operations that would make existing facilities available for the Hard Silo system. Camp Roberts has land available on base for additional support facilities and Weapons Storage Area/Stage Storage Area facilities for the Hard Silo mission, but the land is constrained by functional land-use conflicts, adverse

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terrain, and contamination of ordnance. Off-base expansion is feasible. Presently, 98 percent of the land on base is DoD fee owned.

The majority of the utility infrastructure at Camp Roberts is adequate for present base operations, although many of the utilities would require modernization and expansion to support the Hard Silo system. Pacific Gas and Electric supplies electricity to the base via supply lines that are shared by the town of Bradley. Expansion would require the installation of a new substation. Heating is supplied by liquified petroleum gas. Present supply is adequate for present demand. Conversion to natural gas would be required to meet the Hard Silo system requirements.

The on-base waste-water treatment plant has a 3 million gallon-per-day design capacity. Present capacity is 1 million gallons-per-day and usage is at 85 percent of capacity. Domestic and industrial solid wastes are collected and disposed of on base at a 9.2 acre landfill site. The landfill capacity is more than adequate to meet future needs and has a high potential for expansion. The base storm drainage system consists of a network of underground drains and open ditches that drain into the Salinas River. The system is adequate for present conditions and could accommodate expansion of support facilities. Ground water may be available

through direct development to support the base needs of the Hard Silo mission. Overdrafting would continue but the practice is not currently prohibited by the state water law. Ground water would require more than conventional treatment prior to domestic use.

Expansion of existing water supply facilities would be required to support the increased base needs due to the Hard Silo mission. Surface water may be available through purchase/transfer of existing water rights.

The Camp Roberts transportation system is limited by a lack of airfield facilities on base. The main airfield is a 2,600-foot, uninstrumented helicopter pad. Paso Robles, 15 miles southeast, is equipped with one 4,700-foot and one 6,000-foot runway. Highway access is provided by U.S. Highway 101, which runs through the installation. Rail service, which is provided by the Southern Pacific Railroad, runs through the northeast portion of the base. The base is served by two active railroad spurs with a storage capacity of 37 cars.

Because Camp Roberts is a National Guard installation the existing logistic and personnel support systems would need to be augmented to become compatible with Air Force operations.

The support services for Camp Roberts are moderate, as indicated by the availability of housing and the

proximity to a community. On-base housing is barely adequate for the present needs, but expansion is feasible. Availability of off-base housing at reasonable rates is moderate in the town of Atascadero (population 16,000), which is the largest town within 25 radial miles of Camp Roberts. Atascadero could provide only limited goods and services; the nearest community that can provide a full range of goods and services is San Luis Obispo, 38 road miles from Camp Roberts.

System Practicability: Construction aggregate is available through purchase and/or development of sources distributed throughout the region. Adverse terrain is present in portions of every parcel and affects 21 percent of the Deployment Area. This condition in the potential Deployment Area may impose some system siting constraints and can increase construction and security surveillance costs. Ground water for system construction and operation may be available in the potential Deployment Area through direct development. Overdrafting of the ground-water basins would continue, but overdrafting is not currently prohibited by state laws. Due to poor water quality in some areas, ground water may require more than conventional treatment prior to some construction uses. Surface water may be available through purchase/transfer of existing water rights in many areas.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the Camp Roberts Deployment Area varies from parcel to parcel. Approximately 82 percent of the potential Deployment Area is under agricultural development, and 12 percent of the potential Deployment Area is classified as prime and unique farmland. Potential timberland is concentrated in two small parcels, and occurs in less than 1 percent of the potential Deployment Area. Presently, 3 percent of the townships within the Deployment Area have 20 percent or more area under claim/lease coverage for mineral and energy resources. Known energy resource areas occur in 49 percent of the townships. None of the townships contain high value mineral resources. Future land-use development plans may adversely affect portions of the potential Deployment Area.

There is no on-installation suitable area at Camp Roberts. There is also no on-installation suitable area within 50 miles of Camp Roberts, and therefore no potential for Hard Silo deployment on DoD/DoE installations within 50 miles of Camp Roberts. The Deployment Area occurs predominantly on privately owned land, with a small amount of area located on federally (BLM) administered land.

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Transportation and utility corridors affect 77 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. A minimal impact on water availability in the support community of San Luis Obispo is likely to occur due to the increase in population from project workers and their dependants. Although expansion of the existing water supply system would be required, ground water could be developed to meet the additional needs.

Surface water is not available to the support community, but may be available to the base through purchase/transfer of existing water rights. Surface water will not require more than conventional treatment prior to domestic use.

Natural hazards in the potential Deployment Area are minimal. Small portions of most parcels are located within identified 100-year floodplains, affecting 13 percent of the Deployment Area. Due to the large area of low density inhabited structures within the Deployment Area, public safety conflicts and security concerns should be minimal.

The relatively small urban communities of Paso Robles and San Luis Obispo could be significantly affected if they were to absorb the influx of support personnel and dependents arising from Hard Silo system deployment at

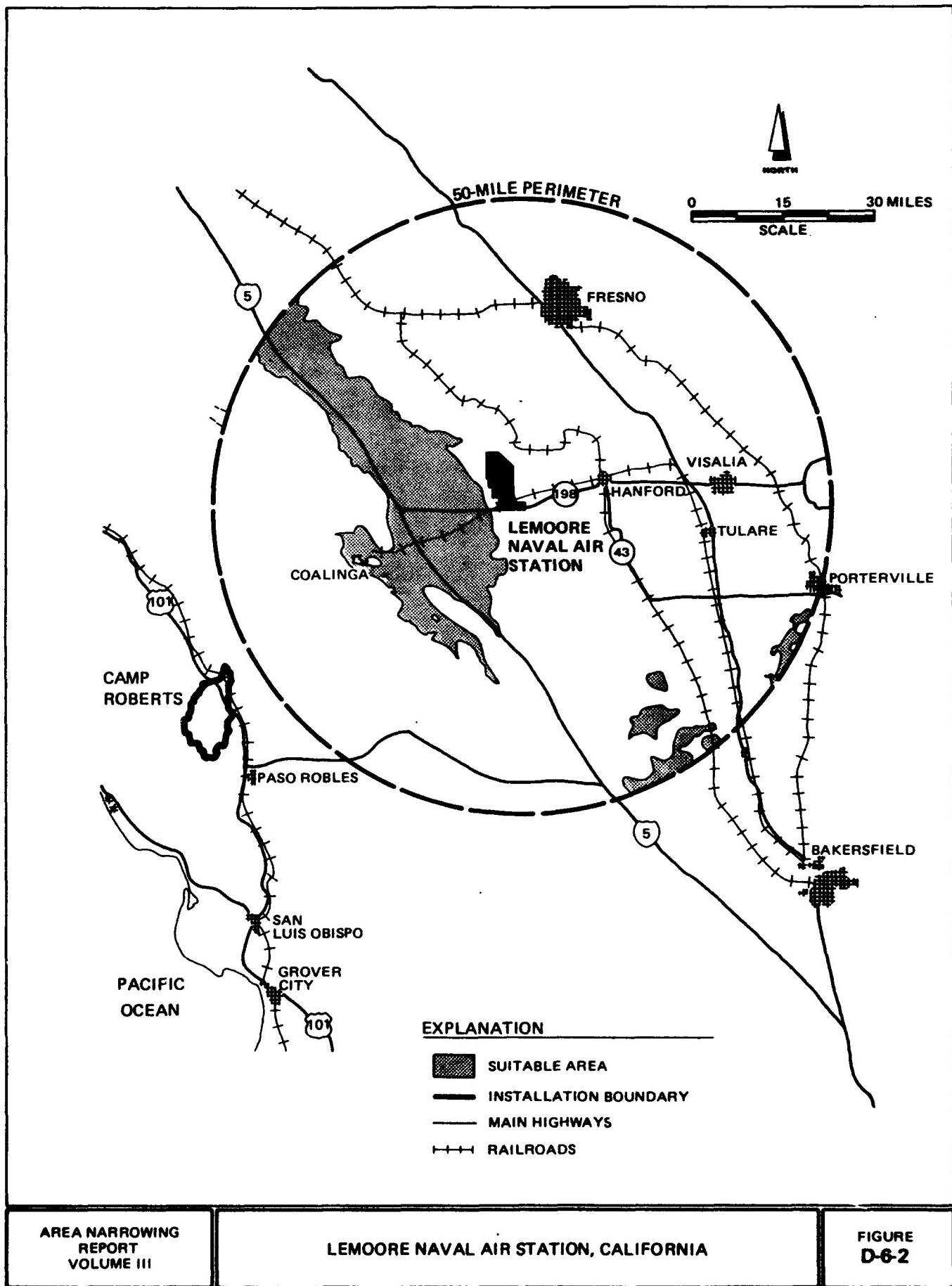
Camp Roberts. Paso Robles, which is contiguous with the base cantonment area, Grover City, and San Luis Obispo are the only sizeable communities with the region, but they can provide only limited goods and services. Nonagricultural employment is also relatively low, which increases the likelihood of inmigration of project-related workers. Employment in the construction and military sectors is high, however, which means any new workers will most likely have backgrounds similar to those of the resident population. The region has more export-producing industries than other areas examined, which indicates good economic diversity. Local governments in the region have been able to capture tax revenues over the short-term and should be able to address potential expenditure demands. Housing availability in the region is also relatively adequate. The city of San Luis Obispo could alleviate some of the comparative regional disadvantages but is probably too distant to have a significant effect.

Environmental Impacts: The potential Deployment Area is in attainment for all major pollutants and activities within the Deployment Area would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites located within the Deployment Area are listed in the National Register of

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Historic Places. Discovery of additional cultural resource sites is likely if a detailed field survey were performed in the Deployment Area. Wilderness Study Areas, RARE II areas, National/State forest lands, and experimental ranges/farms do not occur within the potential Deployment Area.

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D-6.2 Lemoore Naval Air Station, California

After evaluating the alternatives among the complexes in relation to each other, Lemoore Naval Air Station (NAS) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the amount of potential deployment area that is dissected by transportation and utility corridors, the intense agricultural use of the area, and lack of support services in the immediate vicinity.

Lemoore NAS is located in central California, approximately 35 miles south of the city of Fresno and 30 miles west of the city of Visalia (Figure D-6-2). The installation is a Naval operations center for aviation activities of the Pacific Light Attack Wing.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Lemoore NAS would provide limited options for siting the Hard Silo system. The potential Deployment Area consists of six suitable area parcels that contain a total of 871 square miles. Five of these parcels range in size from 6 to 46 square miles. The sixth parcel is 770 square miles in area and is located west of Lemoore NAS.

Large areas of low density inhabited structures within the potential Deployment Area would cause some security

concerns. Transportation and utility corridors affect a large portion of the potential Deployment Area and would cause additional security concerns.

System Operability: The efficiency of Main Operating Base activities at Lemoore NAS would be decreased by the distance (30 road miles) to Visalia, the nearest community capable of providing a wide range of goods and services. The town of Lemoore, with a population of 8,800, is adjacent to the cantonment area, but it has a small population and is unlikely to provide the goods and services required for the Hard Silo system. The accessibility of the Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected and its distance from the base. Distances to parcel areas from Lemoore NAS range from 47 to 78 road miles and average 63 road miles. These distances could hamper maintenance operations.

Lemoore NAS has land available on base for new support facilities, including Weapons Storage Area/Stage Storage Area facilities. The base does not expect a reduction in future operations that would increase the availability of existing facilities for the Hard Silo mission. Nearly 100 percent of the on-base land is either DoD fee-owned or withdrawn for military use.

The utility infrastructure at Lemoore NAS is adequate for present base operations and has a potential for

expansion to accommodate future requirements.

Electrical power is supplied by the Western Area Power Administration over Pacific Gas and Electric Company lines. Distribution lines in the support area are nearing their peak loads and will require upgrading to increase capacity. Heating is provided by natural gas supplied by the Southern California Gas Company and additional gas supplies are readily available. The base operates two waste-water treatment plants which have capacity to accommodate additional demands. The existing landfill will reach capacity in 1997; planned expansion of the land fill will permit use until 2022. The base storm drainage system consists of a network of underground drains and open ditches that appears adequate to handle present runoff but may require upgrading and expansion if additional facilities are constructed. It is likely that surface water would be available through purchase from local water agencies to meet the base demand of the Hard Silo system. Expansion of on-base water-supply facilities would be required. Additional development of ground-water resources would continue overdrafting of the ground-water basin. Ground water may be of poor quality and may require more than conventional treatment prior to domestic use.

The existing transportation system at Lemoore NAS is very good. The base has two 13,500-foot, fully

instrumented runways. The Coalinga branch line of the Southern Pacific Railroad passes through the base and crosses the main line of the Sante Fe Railway in the nearby community of Hanford. Highway access is provided by State Route 198, which passes the main gate and leads to State Route 43 and Interstate 5.

Because Lemoore NAS is a Naval facility, the existing personnel and logistic support systems would need to be augmented to be compatible with Air Force operations.

The support services for Lemoore NAS are moderate, as indicated by the availability of housing and the proximity to a community. Available on-base housing is limited, with a 99 percent occupancy rate. A sufficient amount of housing is available off base at reasonable rates. The largest town within 25 miles is Hanford (population of approximately 21,000), which is capable of providing only a limited range of goods and services.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are unevenly distributed throughout the region. Adverse terrain affects approximately 8 percent of the potential Deployment Area, which may impose limited siting constraints and can increase construction and security surveillance costs. It is

likely that ground water for system construction and operation will be available in the potential Deployment Area through continued overdrafting of the ground-water basin. Ground water is of poor quality in local areas and may require more than conventional treatment prior to some construction uses. Surface water may be available through purchase from local water agencies in the western portion of the Deployment Area.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the Lemoore NAS Deployment Area varies from parcel to parcel. Approximately 92 percent of the potential Deployment Area lies within agricultural lands, and 6 percent of the potential Deployment Area is classified as prime and unique farmland. The Deployment Area contains no timberland. Three percent of the townships within the potential Deployment Area have 20 percent or more area under energy or mineral claim/lease. Approximately 44 percent of these townships contain known energy resources. None of the townships contains high value mineral resource areas. Future land use development plans and trends are expected to have some adverse effect on the Deployment Area.

The lack of on-installation suitable area within 50 miles of Lemoore NAS precludes any potential for Hard

Silo deployment on DoD installations. The potential Deployment Area occurs exclusively on private land.

Transportation and utility corridors affect approximately 56 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. The water demand from a project-related work force and their dependents is expected to have a minimal effect on the support community because of the potential availability of both surface and ground water. However, expansion of existing water-supply facilities would be required. Ground water is generally of poor quality and may require more than conventional treatment prior to domestic use.

Natural hazards in the potential Deployment Area are minimal. Approximately 16 percent of the potential Deployment Area is located within known 100-year floodplains. There are some public safety concerns within the potential Deployment Area because large areas within the parcels contain a low density of inhabited structures.

Deployment of the Hard Silo system could raise social and economic concerns in the Lemoore NAS area. The region of influence surrounding the base has a relatively small population. The city of Visalia can

provide a wide range of goods and services, but the outlying areas have very limited goods and services for support of system construction and operation.

Nonagricultural employment in the region is moderate, which may decrease the likelihood of inmigration of project-related workers. Employment in the construction and military sectors within the region is also average, which implies that new workers are likely to have backgrounds dissimilar to those of the resident population. The economic diversity of the region is good, as indicated by the number of export-producing industries in the area. Local governments in the region may be relatively able to capture tax revenues in the short term to address potential expenditure demands. The region and the vicinity of Lemoore NAS would be able to provide a reasonable amount of housing.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants. Activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places occur within the potential Deployment Area. Additional cultural resource sites may be discovered if a detailed field survey were performed in the Deployment Area. No

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Wilderness Study Areas, Rare II areas, experimental ranges/farms, or National/State forest lands are present within the potential Deployment Area.

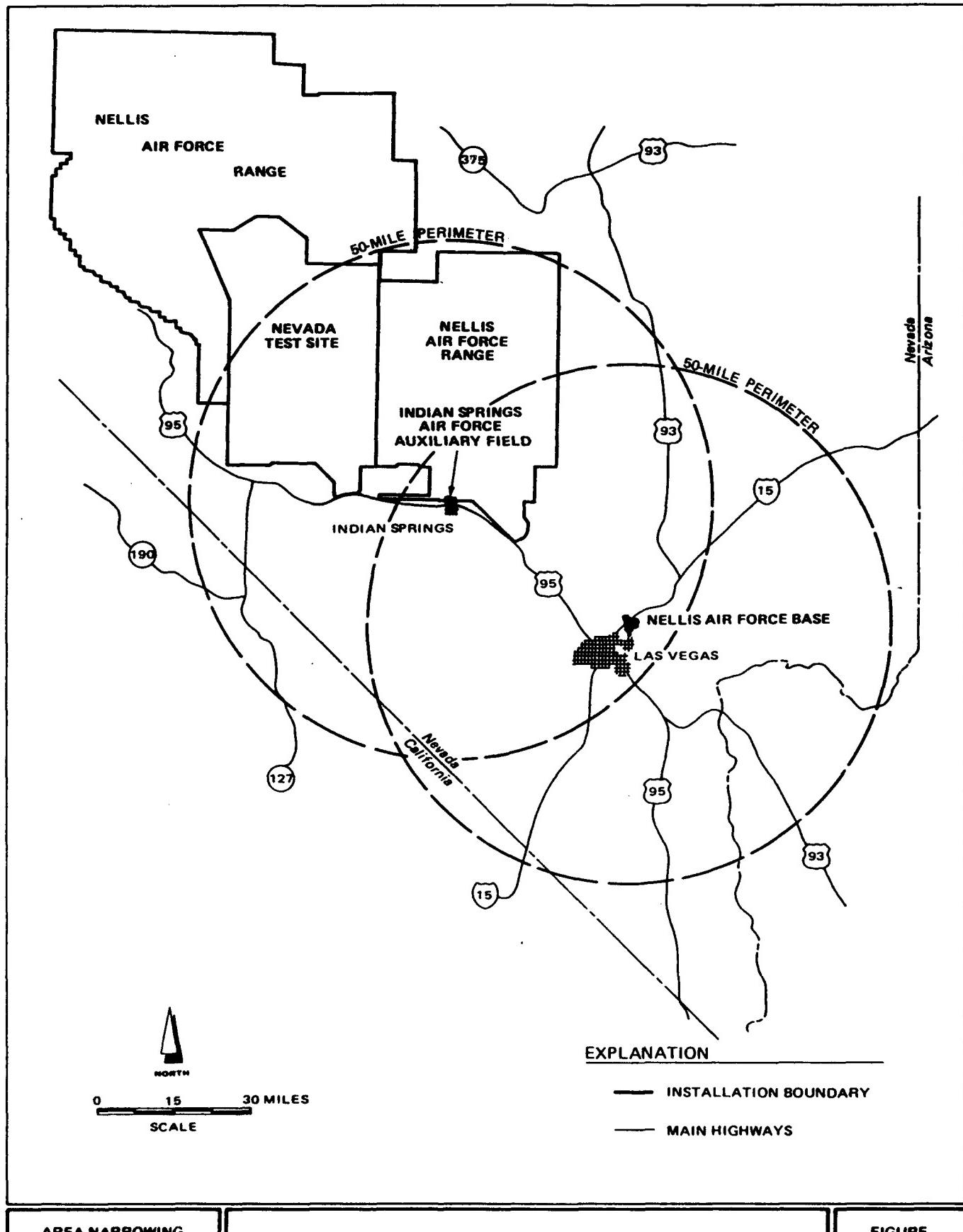
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AREA NARROWING
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NEVADA - SOUTHERN COMPLEX

FIGURE
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D-7 Nevada - Southern Complex

Following application of the Exclusionary Criteria, Indian Springs Air Force Auxiliary Field and Nellis Air Force Base were grouped into a complex (Figure D-7).

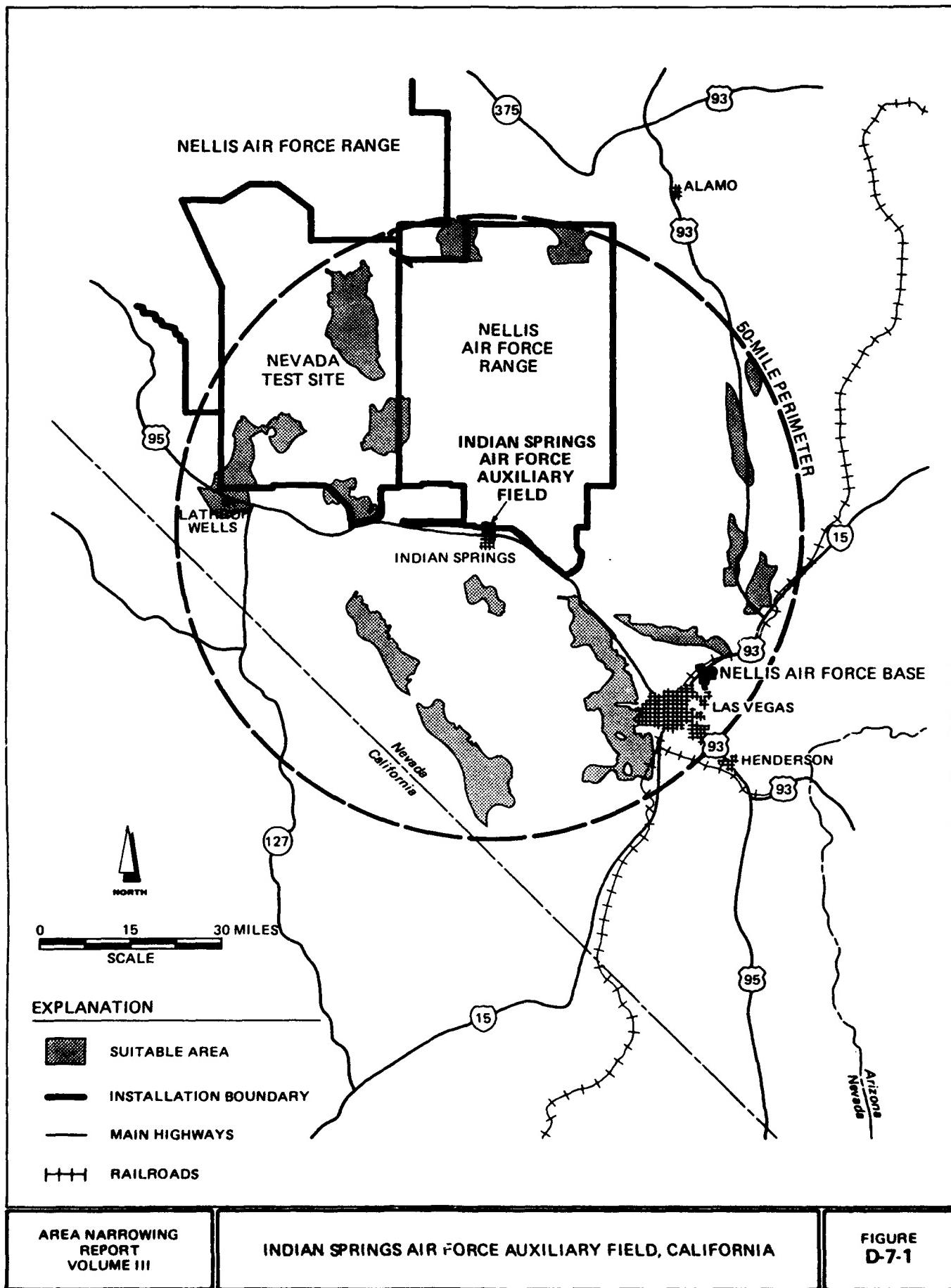
Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of Indian Springs AFAF. Application of the Evaluative Criteria to the 14 complexes resulted in the elimination of Nellis AFB and its potential Deployment Area. The major factors in these determinations were:

Indian Springs Air Force Auxiliary Field - distance to the more feasible deployment areas and the lack of support services in the immediate vicinity.

Nellis Air Force Base - size of many of the potential deployment areas, distance to the more feasible deployment areas, and the current activities on the base.

The following sections elaborate on the performance of each potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

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D-7.1 Indian Springs Air Force Auxiliary Field, Nevada

After evaluating the alternatives within the complex in relation to each other, Indian Springs Air Force Auxiliary Field (AFAF) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the distance from the base to the more feasible deployment areas and the lack of support services in the immediate vicinity.

Indian Springs AFAF is located in southern Nevada, 38 miles northwest of Las Vegas (Figure D-7-1). The base adjoins the southern boundary of the Nellis South Range. The base is presently used for gunnery range maintenance support for the Nellis Air Force Range, as well as an emergency and practice airfield in support of Nellis Air Force Base.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Indian Springs AFAF would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of 15 parcels, which total 821 square miles of suitable area. Eleven small parcels range in size from 7 to 57 square miles. The four remaining parcels range in size from 97 to 161 square miles.

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Security concerns within the potential Deployment Area would be minimal due to the overall low density of inhabited structures located within the parcels. Transportation and utility corridors affect portions of the potential Deployment Area and cause additional security concerns.

System Operability: The operational efficiency of Indian Springs AFAF as a Main Operating Base for Hard Silo deployment would be degraded by the travel distance (38 road miles) to the support community (Las Vegas) that could provide the base with a wide range of goods and services. The city of Indian Springs, which lies adjacent to Indian Springs AFAF, has minimal goods and services and a small population (approximately 1,500). The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the base. Travel distances from the AFAF to the parcels range from 19 to 105 road miles and average 55 road miles; these distances could hamper system operations.

The base does not expect a mission loss that would increase the availability of its limited facilities for the Hard Silo mission. Sufficient on-base area is available for new support facilities as well as Weapons

Storage Area/Stage Storage Area facilities because Indian Springs AFAF is contiguous with the Nellis South Range. Presently, all on-base land is DoD fee-owned or withdrawn for military use.

The utility infrastructure at Indian Springs AFAF is adequate for present base operations, but would require expansion to meet the needs of the Hard Silo mission.

Electrical power is supplied by the Nevada Power Company, and there is presently surplus capacity.

Heating is provided by diesel fuel, and is transported from Nellis Air Force Base. There are no known natural gas pipelines or distribution facilities extending to the base. Waste water at Indian Springs AFAF is processed by a twin-lagoon Imhoff disposal system. The system would require expansion to support the Hard Silo mission. Solid wastes are disposed of by contract in the Las Vegas area. The base storm drainage system is minimal and appears inadequate for present facilities, as indicated by occasional flooding on portions of the installation. It is uncertain whether there is sufficient ground water available through development and/or purchase of existing supplies to support the base demands of the Hard Silo mission. The ground-water basin from which the base derives its water is in overdraft and there is no local surface-water source. Ground-water quality may be poor

in some areas and the water may require more than conventional treatment prior to domestic use.

Expansion of the existing water-supply facilities would be required.

The base has a limited transportation system. The airfield has a 7,650-foot runway with limited instrumentation. The nearest runway longer than 10,000 feet is located at Nellis Air Force Base. The road system for accessing the base is adequate; U.S. Highway 95 bisects the base, separating its small housing area from the remaining cantonment area. Indian Springs AFAF does not have a rail siding; the nearest rail sidings are located at Nellis Air Force Base.

Because Indian Springs AFAF is operated by the Air Force, the existing logistic and personnel support system would be compatible with the Hard Silo mission. Personnel assigned to the Auxiliary Field are fully supported by Nellis AFB.

Indian Springs AFAF has very limited support services, as indicated by the distance to the support community and the availability of housing. The nearest support community capable of providing a wide range of goods and services for base personnel is Las Vegas. There are few available family housing units on base, and the town of Indian Springs has very limited housing.

System Practicability: Construction aggregate is available through direct development and/or purchase from sources well distributed throughout the region. Adverse terrain conditions have some impact on the potential Deployment Area. Adverse terrain, which could increase construction and security costs, is present in 19 percent of the Deployment Area. It is uncertain whether sufficient ground water would be available in the potential Deployment Area through appropriation, and/or purchase/transfer of existing water rights. Ground-water quality may be poor in some areas and water may require more than conventional treatment prior to construction and operation use. Surface water is potentially available in the parcels located southeast of the base, and does not require treatment for construction use.

Public Impacts: The potential for land-use conflicts in the potential Deployment Area is low. The parcels contain no agricultural land, prime and unique farmland, or timberland. Approximately 56 percent of the townships within the potential Deployment Area have greater than 20 percent of their areas under energy or mineral claims/lease. However none of these townships are known to have high value mineral or known energy resource areas. Future land use development plans and trends are not expected to have an effect on the

potential Deployment Area.

There is no on-installation suitable area at Indian Springs AFAF, however, a total of 319 square miles of suitable area, or 39 percent of the potential Deployment Area, occurs on DoD/DoE installations within 50 miles of Indian Springs AFAF. This large amount of on-installation suitable area provides a high potential for siting the Hard Silo system on DoD/DoE lands. The remainder of the potential Deployment Area is primarily located on federally administered (BLM) land.

Transportation and utility corridors affect 14 percent of the potential Deployment Area affecting the degree of siting flexibility in deploying the Hard Silo system. Increased water demands from project workers and their dependents could have significant effect on the water available in the support community of Las Vegas. Present surface-water supplies are being used near their capacity and additional development of ground-water supplies is unlikely.

Natural hazards in the potential Deployment Area are minimal. Portions of most parcels are located within identified 100-year floodplains, but affect only 5 percent of all suitable parcel area. Public safety concerns should be minimal because most parcels contain very few inhabited structures.

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The city of Las Vegas can provide a wide range of goods and services but the region's population is relatively small and the outlying areas of the region have very limited goods and services for support of system construction and operation. Nonagricultural employment is relatively low, which increases the likelihood of immigration of project-related workers. The number of people working in the construction and military sectors in the region is low, which means new workers will have backgrounds dissimilar to those of the resident population. The economic diversity of the region is moderate based on the number of export-producing industries in the region. Local governments in the region should be able to capture some tax revenues in the short term to satisfy potential expenditure demands. Although the availability of housing in the Las Vegas support community is good, housing availability elsewhere in the region is relatively low.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants with the exception of two parcels located near Las Vegas which are in non-attainment for at least two pollutants. Activities within the Deployment Area would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within

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the Deployment Area. Additional cultural sites may be discovered if a detailed field survey were performed. Wilderness Study Areas, RARE II areas, National/State forest land, and experimental ranges or farms do not occur within the potential Deployment Area.

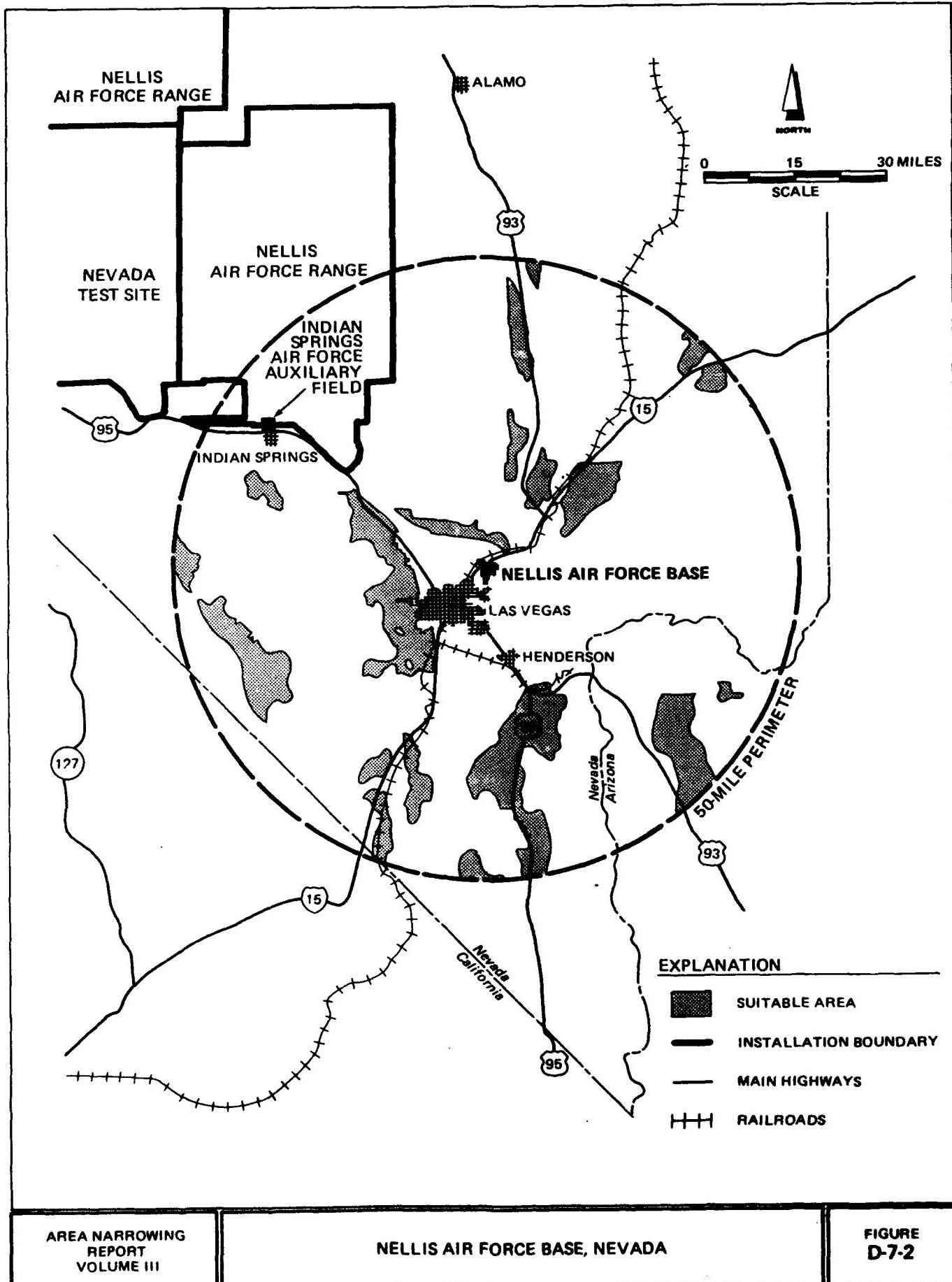
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D-7.2 Nellis Air Force Base, Nevada

After evaluating the alternatives among the complexes in relation to each other, Nellis Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the size of many potential deployment areas and the distance from the base to the more feasible deployment areas.

Nellis AFB is located in southeastern Nevada, approximately 6 miles northeast of Las Vegas (Figure D-7-2). The base is operated by the Air Force Tactical Air Command and is home of the Air Force Tactical Fighter Weapons Center.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Nellis AFB would provide limited options for siting the Hard Silo system. The potential Deployment Area consists of 19 parcels that total 918 square miles. The 14 smallest parcels range in size from 7 to 36 square miles. The five larger parcels range in size from 67 to 196 square miles.

Security concerns within the potential Deployment Area would be minimal due to the sparse distribution of inhabited structures within the suitable parcels.

However, transportation and utility corridors in the Deployment Area could raise some security concerns.

System Operability: The operational efficiency of Nellis AFB as a Main Operating Base for Hard Silo deployment would be enhanced by its proximity (6 miles) to Las Vegas, the nearest community that could supply a wide range of goods and services. The accessibility to base maintenance facilities is dependent upon the final parcel(s) selected and its distance from the Main Operating Base. Distances to parcels from Nellis AFB range from 8 to 83 road miles and average 47 road miles, a distance that could hamper maintenance operations.

Sufficient land is available on base for new support facilities as well as Weapons Storage Area/Stage Storage Area facilities for the Hard Silo mission. No reduction in base operations or mission loss is expected that would increase the availability of existing facilities for the Hard Silo mission. Presently, 40 percent of the land at Nellis AFB is DoD fee owned and 59 percent is withdrawn for military use.

The utility infrastructure at Nellis AFB is adequate for current base operations, with some potential for expansion to meet future demands. Electrical power

is supplied to the base by the Nevada Power Company. The Western Area Power Administration is scheduled to begin service in 1989, adding to the potential source of power in the area. Heating is provided by natural gas and fuel oil. Natural gas is supplied by the Southwest Gas Corporation and fuel oil is supplied by direct pipeline from CAL-NEV. The heating systems have some excess capacity. The installation's principal waste-water treatment facilities are operated by the Clark County Sanitation District; the facilities have the capacity to accommodate additional needs. The existing landfill has limited capacity, but a site is being prepared for an additional 9 years of projected use. The storm drainage system appears inadequate to handle heavy storms, which have at times shut down base runways. It is questionable whether sufficient ground water is available through direct development to support new facilities for the Hard Silo mission. The ground-water basin is presently in overdraft and demand for surface-water supplies is nearing capacity. Water quality is good requiring only conventional treatment prior to domestic use. Significant expansion of the existing water-supply facilities would be required.

The Nellis AFB transportation system is good. The airfield has two instrumented runways longer than 10,000 feet. The regional roadway system is adequate

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for Hard Silo deployment needs. Principal access to the base is provided by U.S. Highway 93 and Interstate Highway 15. Nellis AFB is served by a rail spur from the Union Pacific Railroad, which enters the base from the northeast.

Because the base is operated by the Air Force, existing logistic and personnel support services would be compatible with the Hard Silo mission.

The support services for Nellis AFB are good, as indicated by the size of the support community, its proximity to the base, and the availability of housing. Las Vegas, with a population of about 165,000, is the nearest community capable of providing a wide range of public services. Although some on-base housing is available, additional housing would be required to support the Hard Mobile system. The availability of off-base housing is very good.

System Practicability: Construction aggregate is available through direct development and/or purchase. Aggregate sources are distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some siting constraints. Sixteen percent of the Deployment Area contains adverse terrain. It is questionable whether sufficient ground water could be obtained in the potential Deployment Area.

through appropriation and/or purchase/transfer of existing water rights. Some ground water in the suitable area parcels is of poor quality and requires more than conventional treatment prior to domestic and/or construction use. Surface water is potentially available in the central and southeastern portions of the potential Deployment Area, and would not require treatment prior to construction use.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system is low. The potential Deployment Area contains no agricultural land, prime and unique farmland, or timberland. Currently, 82 percent of the townships in the suitable area parcels contain greater than 20 percent energy and mineral resource claims/leases; however, high-value mineral and known energy resource areas do not occur within these townships. Future land use development plans and trends are expected to have a limited effect on the potential Deployment Area.

There are no suitable area parcels on Nellis AFB or on DoD/DoE installations within 50 miles of Nellis AFB. The suitable area parcels are predominantly located on federally administered (BLM) land, with a small amount of privately-owned land.

Transportation and utility corridors affect 38 percent of the potential Deployment Area and decrease the

siting options available to the Hard Silo system. A significant demand on water supplies in the support community of Las Vegas is likely to occur due to the increase in population from project workers and their dependents. Increased water demands due to Hard Silo deployment could overload the present surface-water supply system, which is presently near capacity. Additional development of ground-water supplies is unlikely. Additional water requirements in the support community would require only conventional treatment prior to domestic use.

Natural hazards in the potential Deployment Area are considered minimal. Portions of most parcels are located within known 100-year floodplains that affect approximately 6 percent of the Deployment Area. Public safety concerns within the suitable area parcels should be minimal due to the sparse distribution of inhabited structures.

The region of influence surrounding the base has a relatively small population, which indicates a limited range of goods and services, although the nearby city of Las Vegas should be able to provide a wide range of goods and services. Nonagricultural employment in the region is relatively low, which increases the likelihood of immigration of project-related workers.

The economic diversity of the region is good, as indicated by the number of export-producing industries in the region. Regional employment in the construction and military sectors is relatively low, which implies that new workers will likely have backgrounds dissimilar to those of the resident population. Local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the region is somewhat limited, but the housing availability in the vicinity of Nellis AFB is good. Many of the comparative regional disadvantages should be overcome to a large extent by the proximity of the city of Las Vegas.

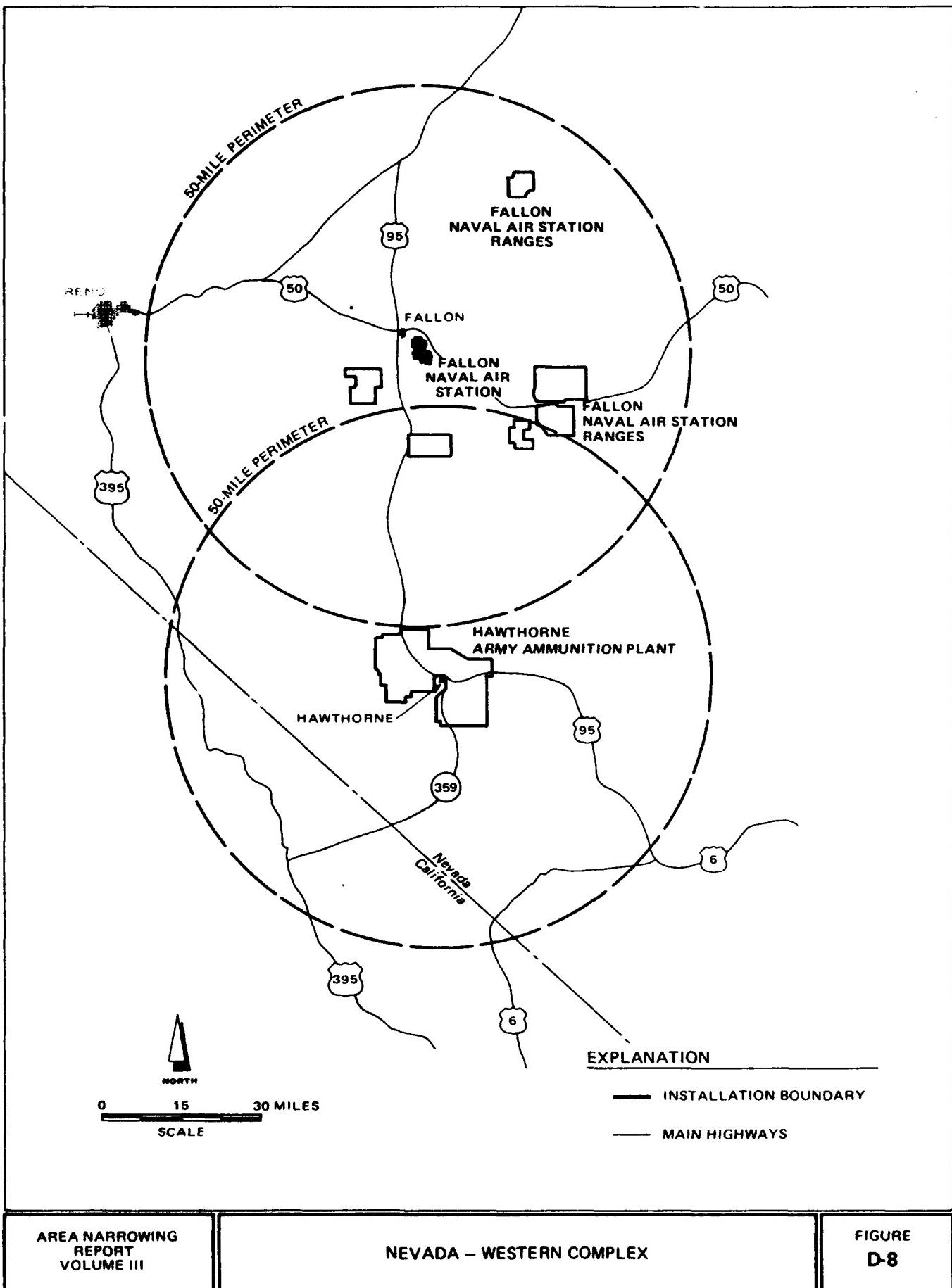
Environmental Impacts: The potential Deployment Area is presently in attainment for all major air pollutants, with the exception of one parcel in the vicinity of Las Vegas in which activities would be likely to affect a Prevention of Significant Deterioration (PSD) Class I area. Activities in the remaining suitable area parcels would be unlikely to affect any PSD Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Additional cultural resource sites are likely to be discovered if a detailed field survey were performed. National/State

forest lands and experimental ranges/farms do not occur within the potential Deployment Area. Wilderness Study Area and RARE II areas occur in 2 percent of the suitable area parcels.

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D-8 Nevada - Western Complex

Following application of the Exclusionary Criteria, Fallon Naval Air Station and Hawthorne Army Ammunition Plant were grouped into a complex (Figure D-8).

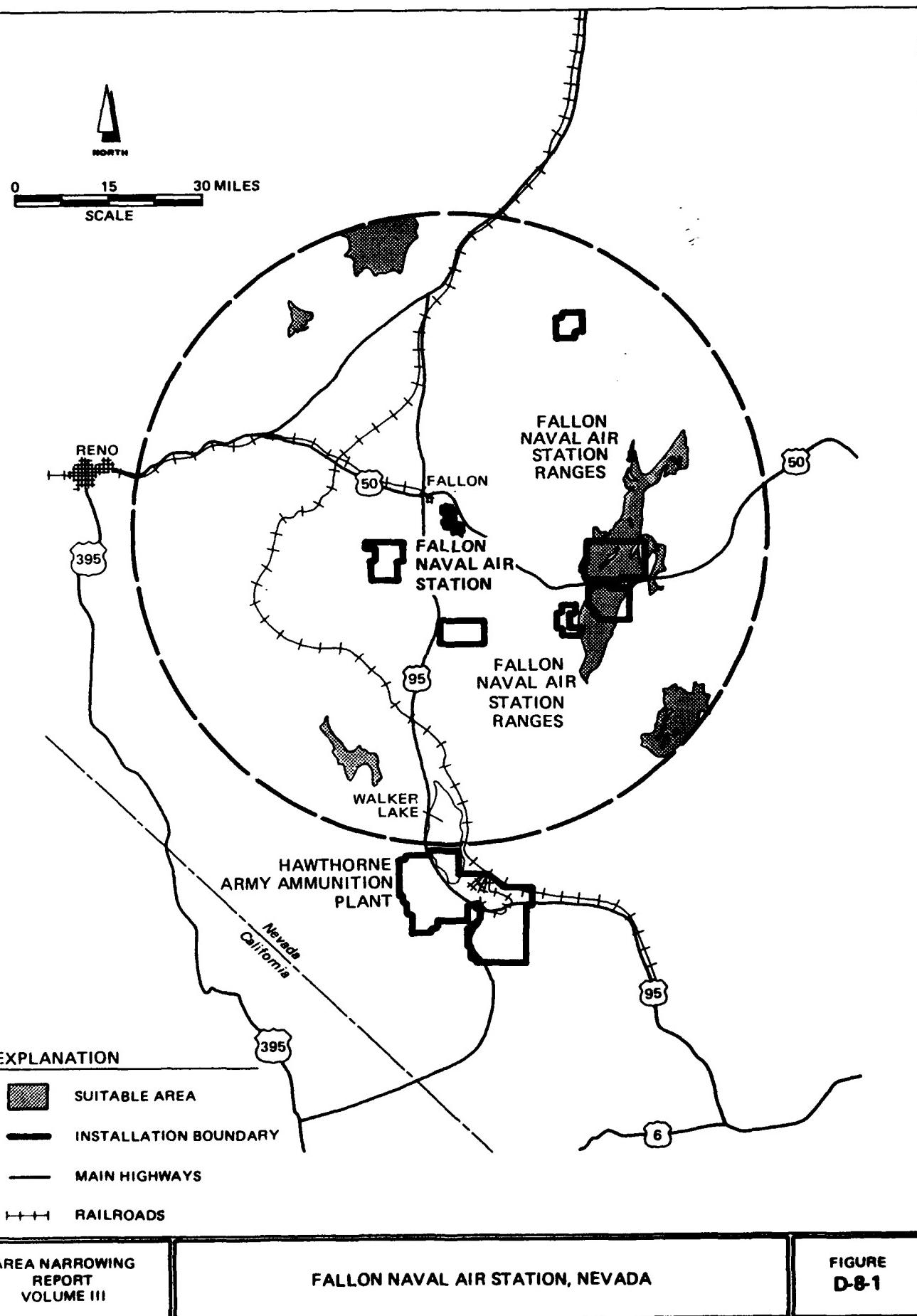
Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of Hawthorne AAP. The application of the Evaluative Criteria to the 14 complexes resulted in the elimination of Fallon NAS and its potential Deployment Area. The major factors in these determinations were:

Fallon Naval Air Station - distance to the potential deployment areas and the limited support services available in the immediate vicinity.

Hawthorne Army Ammunition Plant - size of potential deployment areas, lack of air facilities, and the limited support services available in the immediate vicinity.

The following sections elaborate on the performance of each potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

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D-8.1 Fallon Naval Air Station, Nevada

After evaluating the alternatives among the complexes in relation to each other, Fallon Naval Air Station (NAS) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the distance to the potential deployment areas and the limited support services available in the immediate vicinity.

Fallon NAS is located in northern Nevada, 6 miles southeast of the city of Fallon and approximately 60 miles east of the city of Reno (Figure D-8-1). The base is used as an air warfare training area by the Navy.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Fallon NAS provide a number of options for siting the Hard Silo system. The potential Deployment Area consists of five suitable area parcels that contain a total of 386 square miles. The parcel sizes range from 10 to 200 square miles.

Security concerns within the potential Deployment Area would be minimal because most parcels contain only isolated inhabited structures. The distribution of

transportation and utility corridors affects portions of the Deployment Area and causes some security concerns.

System Operability: The efficiency of Main Operating Base activities of Fallon NAS would be degraded by the excessive distance to Reno (60 miles), the nearest community that can provide a wide range of goods and services. Accessibility to Main Operating Base maintenance facilities from the potential Deployment Area is dependent upon the final parcel selected for siting and its distance from the Main Operating Base. Distances to parcels from the Main Operating Base range from 43 to 69 road miles and average 60 road miles. These distances could hamper maintenance operations.

Fallon NAS contains sufficient land for new support facilities, including Weapons Storage Area/Stage Storage Area facilities, to support the Hard Silo mission. The base is not anticipating a mission change that would increase the availability of existing facilities for the Hard Silo system. On-base land is DoD fee owned and land withdrawn for military use.

The utility infrastructure supporting Fallon NAS is adequate for present use, and has a good potential for expansion and/or new development to accommodate the Hard Silo mission. Electrical power is supplied by

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Sierra Pacific Power Company and is more than adequate for present and future needs. Heating is currently provided by natural gas from the Southwest Gas Corporation with an additional gas supply readily available. Waste-water treatment for the Main Operating Base is provided by an on-base collection and treatment system. The plant has a capacity of 0.5 million gallons-per-day and presently operates at 60 percent of capacity. Solid waste is presently taken off-base by private contractor to a facility that has adequate capacity and expandability to meet increased demands. Drainage is controlled by surface ditches, with some low-lying areas that tend to collect runoff. Intense rains may result in the formation of intermittent lakes in dry lake beds.

It is questionable whether sufficient surface or ground water could be developed to meet the increased needs of the base to support the Hard Silo mission facilities and personnel. The base is located in a highly agricultural area where present water supplies are insufficient to meet demands. The ground-water basin is designated by the state and numerous lawsuits in the area make it questionable if water rights could be purchased or transferred to meet increased base needs. Ground-water is locally poor (high arsenic levels presently occur in base wells) and water may require

more than conventional treatment prior to domestic use.

Fallon NAS has a very good transportation system. The base has a primary, 14,000 foot, fully instrumented runway on-base. Rail service is provided by a spur that runs from Hazen Junction to Fallon NAS. Highway access is provided by U.S. Highway 50, which passes north and east of the installation.

Because Fallon NAS controlled by the Navy, the existing logistic and personnel support systems would need to be augmented to become compatible with an Air Force mission.

The support services for Fallon NAS are limited, as indicated by the availability of housing and distance to a large community. Available on-base housing is extremely limited, with a 98 percent occupancy rate; rental units and houses for sale in the Fallon area are both in short supply. The largest community within 25 miles of the base is Fallon, (population of approximately 4,200), which can provide only limited goods and services.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain conditions in the Deployment

Area may impose some system siting constraints. Sixteen percent of the potential Deployment Area contains adverse terrain. It is likely that sufficient water will be available in the potential Deployment Area for system construction and operation. Ground water may be available through appropriation in some suitable area parcels and through purchase/transfer of existing water rights in other parcels. Surface water may also be available through purchase/transfer of existing water rights in many areas. Surface water quality is generally good; ground water may be of poor quality locally, and may require conventional treatment prior to use.

Public Impacts: Potential land-use conflicts from deployment of the Hard Silo system within the Fallon NAS Deployment Area are low. None of the potential Deployment Area contains agricultural lands, prime and unique farmland, or timberland. Presently, 32 percent of the townships within the potential Deployment Area have 20 percent or more area under energy or mineral claim/lease. No known high value minerals or energy resource areas occur in these townships. Future land use development plans and trends are not expected to adversely affect the Deployment Area.

The 75 square miles of on-installation suitable area, or 19 percent of the potential Deployment Area, that

occur on the outlying range areas of Fallon NAS provide some options for Hard Silo deployment on DoD/DoE installations. However, the majority of the proposed Deployment Area is federally administered (BLM) land; a limited amount of the potential Deployment Area is on privately owned land.

Transportation and utility corridors affect approximately 16 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system.

The potential water demands of an induced work force and their families will have a large effect on the water availability in the surrounding small communities. Numerous lawsuits in the designated ground-water basin that contains the base and local communities may prohibit change in water use.

Increased water demand in the Fallon area will have a minimal effect on the identified support community of Reno, which is more than 50 miles from Fallon NAS.

Natural hazards in the potential Deployment Area are minimal; less than 3 percent of the Deployment Area is located within identified 100-year floodplains. Public safety concerns within the Deployment Area would be minimal because very few parcels contain inhabited structures.

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The region of influence surrounding the base has a relatively small population, which indicates a limited range of goods and services. The Reno area could provide a wide range of goods and services, but it is distant and other outlying areas within the region have very limited goods and services. Nonagricultural employment in the region is relatively low, which suggests a high likelihood of immigration of project-related workers. There are relatively few people employed in the construction and military sectors in the region, which means that new workers will likely have backgrounds dissimilar to those of the resident population. The economic diversity of the region is moderate, based on the number of export-producing industries. Local governments in the region would likely be able to capture public revenues in the short term to address potential expenditure demands. Housing availability in the region is very limited. The relatively low regional advantages may be slightly improved by Reno's capabilities but it is probably not close enough to influence most socioeconomic concerns.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants. Activities within the Deployment Area would be unlikely to affect any Prevention of Significant Deterioration

Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the Deployment Area. Based upon the cultural history of the region these types of sites may be discovered in the potential Deployment Area if a detailed field survey were performed. Wilderness Study Areas occupy 9 percent of the Deployment Area. RARE II areas, National/State forest land, and experimental ranges/farms are not present within the potential Deployment Area.

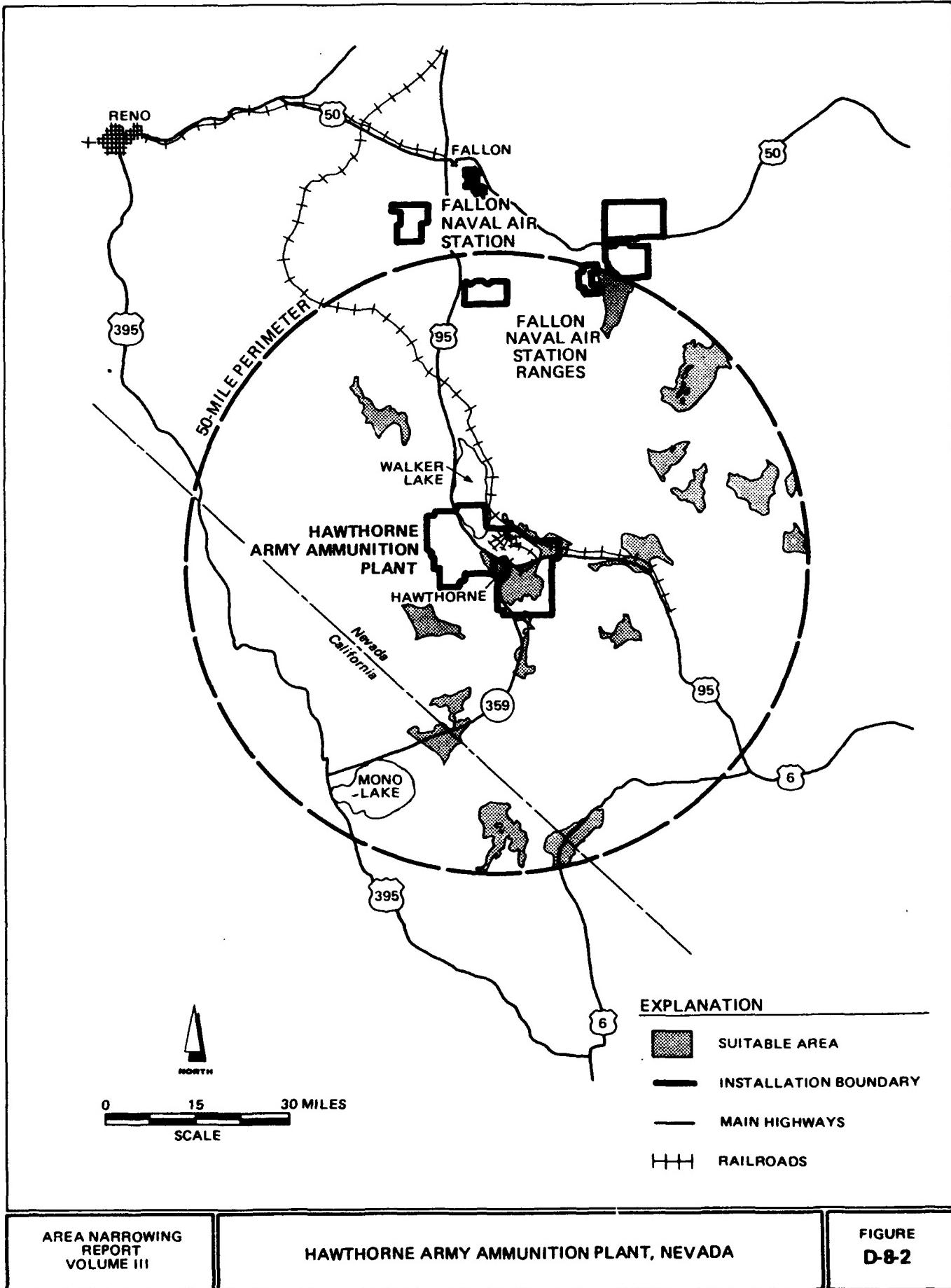
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D-8.2 Hawthorne Army Ammunition Plant, Nevada

After evaluating the alternatives within the complex in relation to each other, Hawthorne Army Ammunition Plant (AAP) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the size of potential deployment areas, the presence of adverse terrain, lack of air transportation support, and limited support services in the immediate vicinity.

Hawthorne AAP is located adjacent to the town of Hawthorne in north-central Nevada. The city of Reno is located approximately 130 miles to the northwest (Figure D-8-2). The installation, under Army command, is a manufacturing and storage area for ammunition, and is operated by civilian contractors.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Hawthorne AAP would provide limited options for siting the Hard Silo system. The potential Deployment Area consists of 16 suitable area parcels that contain 488 square miles. The parcels range in size from 7 to 63 square miles.

Security concerns within the potential Deployment Area would be minimal due to the overall density of

inhabited structures. Small areas of low to high density inhabited structures occur in the suitable area parcel that contains the town of Hawthorne. These structures pose siting and security concerns greater than those found in the remaining parcels. Transportation and utility corridors affect portions of the potential Deployment Area, causing additional security concerns.

System Operability: The efficiency of the Main Operating Base activities would be degraded by the excessive travel distance (130 road miles) to Reno, the nearest support community. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to parcels from the base range from 4 to 94 road miles and average 50 road miles. These distances could hamper maintenance operations.

Hawthorne AAP has land available for new facilities and Weapons Storage Area/State Storage Area facilities to support the Hard Silo mission. In addition, Hawthorne AAP has recently lost an Air Force Strategic Air Command Radar Bomb Scoring Unit mission, which may increase the availability of existing facilities for

the Hard Silo mission. Presently, 97 percent of the land at Hawthorne AAP is either DoD fee owned or land withdrawn for military use.

The majority of the utility infrastructure at the base is adequate for present use but will require considerable expansion and/or new development to accommodate the Hard Silo mission. Electrical power is presently supplied by the Sierra Pacific Power Company. The available capacity is more than adequate to meet mission needs. Fuel oil and coal are used in steam plants to provide heat at Hawthorne AAP. The system is adequate for present needs, but may require expansion to meet new demands. Waste-water treatment at the base is provided by a waste-water digestion plant and septic tanks. The facilities are adequate to meet current demands but would require repair and renovation to attain maximum capacity and support new demands. The plant renovation is planned for 1989. Solid waste is disposed of in an on-base landfill that has an estimated remaining life of 35 years and adequate capacity to meet future needs. The base storm drainage system consists of underground storm drains and a network of open ditches, which are inadequate to handle present runoff. The existing system will require extensive modifications and improvements to accommodate the Hard Silo mission. It is likely that sufficient

surface and ground water can be developed through purchase/transfer of existing water rights or appropriation to support the increased base needs of the Hard Silo mission. The base draws ground water from a ground-water basin that is designated as closed only to new irrigation use. Ground water is of poor quality locally and may require more than conventional treatment prior to domestic use.

Hawthorne AAP has a transportation system that is limited by the lack of air facilities on-base. There are no aircraft facilities at Hawthorne AAP because the 4,800-foot runway was deeded to Mineral County for use by the town of Hawthorne. The nearest runway of usable size is at Fallon Naval Air Station, located 72 miles to the north. A main line of the Southern Pacific Railroad crosses the northeastern portion of the base, and active spur lines provide access to individual buildings or areas. Highway access to Hawthorne AAP is by U.S. Highway 95, which bisects the installation from north to south.

Because Hawthorne AAP is an Army installation operated by civilian contractors, existing logistic and personnel support systems would need to be augmented to be compatible with an Air Force mission.

The support services for Hawthorne AAP are limited.

On-base housing is inadequate for the existing mission

and off-base housing is extremely limited. The town of Hawthorne (population approximately 3,700), which is adjacent to the base, is the largest community within 25 radial miles, and could only provide limited support services. Reno, 130 road miles away, is the nearest city that can provide a wide range of goods and services.

System Practicability: Construction aggregate is available for system construction through purchase and/or direct development. Aggregate sources are distributed throughout the region. Adverse terrain is present in a portion of all the parcels, and affects 28 percent of the potential Deployment Area. This condition may impose some system siting constraints and can increase construction and security surveillance costs. It is likely that sufficient ground water for system construction and operation could be obtained through purchase/transfer of existing water rights in the parcels located in the northern half of the Deployment Area, and through appropriation or direct development in the parcels located in the southern half of the Deployment Area. Many ground-water basins in the northern half of the Deployment Area are designated as closed to certain types of use. Surface water may be available through the purchase/transfer of existing water rights in some areas. Ground water is locally of

poor quality and may require more than conventional treatment prior to construction and operation use.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system is limited. Agricultural land is present in less than 1 percent of the potential Deployment Area and no suitable area is classified as prime and unique farmland. A small amount of potential timberland is present in four parcels but affects only 1 percent of the potential Deployment Area. Future land use development plans and trends are not expected to adversely affect the potential Deployment Area. Presently, 34 percent of the townships in the potential Deployment Area have 20 percent or more area under energy or mineral claim/lease. None of these townships have known energy resource areas and 1 percent of the townships in one parcel are high value mineral resource areas.

The total of 49 square miles of on-installation suitable area located on Hawthorne AAP provides limited options for Hard Silo deployment on DoD/DoE installations. Also, much of the on-installation suitable area is developed, and therefore, is not likely to be useable for siting the Hard Silo system. Ten percent of the potential Deployment Area is located on DoD land. The majority of the potential Deployment

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Area is federally administered (BLM) land, with limited private land.

Transportation and utility corridors affect 35 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. The potential water demand of project-related workers and their dependents will have a substantial effect on the town of Hawthorne and surrounding communities. These communities are all relatively small and expansion of existing water-supply facilities would be required to meet the increased demand. The increased water demand would have a limited effect on water availability in the support community of Reno.

Natural hazards in the potential Deployment Area are considered minimal. Portions of two parcels are located within identified 100-year floodplains and affect only 2 percent of the Deployment Area. Public safety conflicts should be minimal due to the few areas of inhabited structures within the Deployment Area.

The relatively small urban community of Hawthorne could be significantly affected if this area were to absorb the influx of support personnel and dependents arising from deployment of the Hard Silo system at Hawthorne AAP. The distance to Reno (130 road miles), the nearest support community, makes it unlikely that it

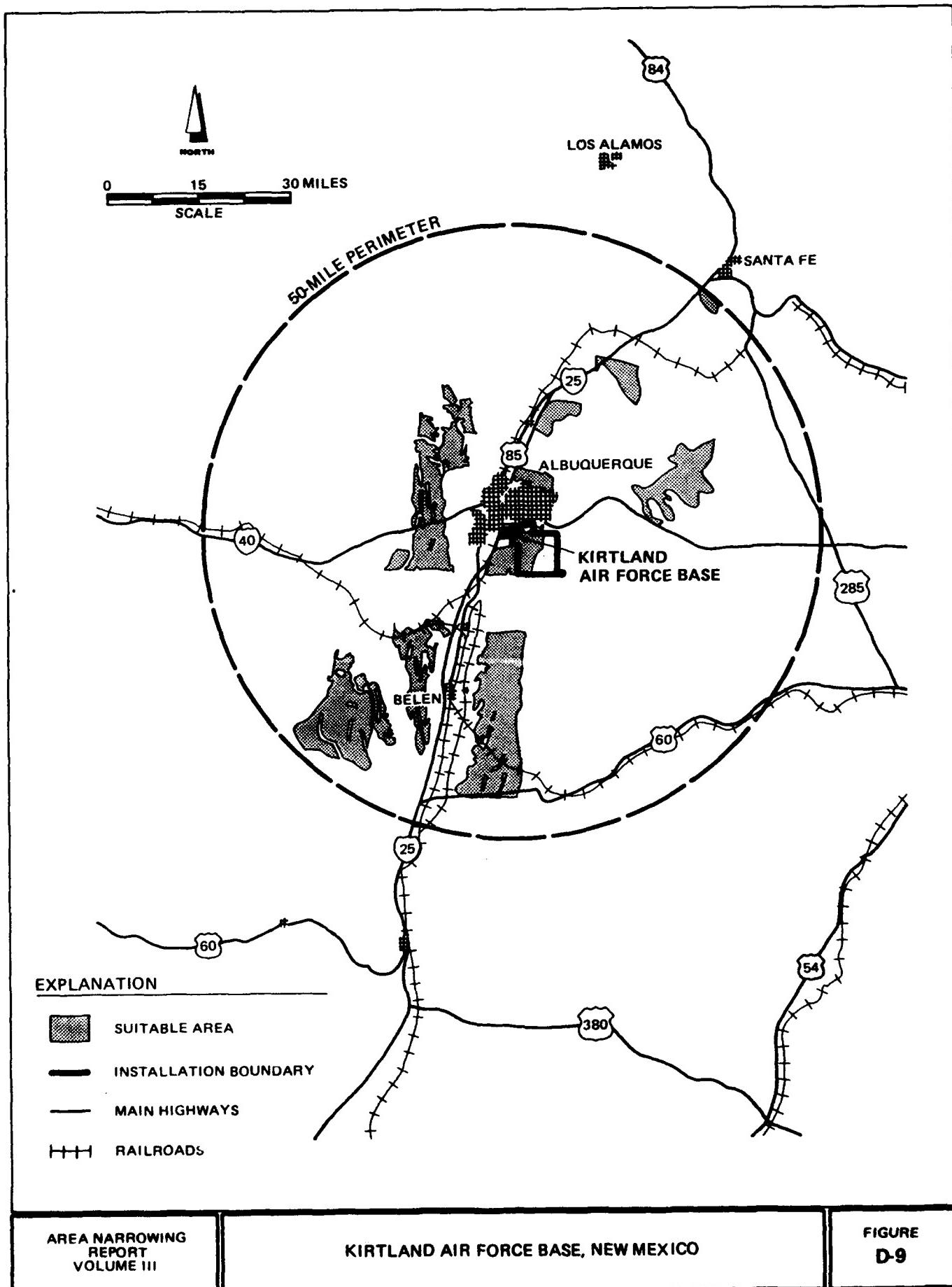
would receive any of the expected population influx. The low urban population in the region indicates that it could not provide many goods and services. Nonagricultural employment is also low, which increases the likelihood of inmigration of project-related workers. Relatively few persons in the region are employed in the construction and military sectors, which suggests that immigrant workers may have backgrounds dissimilar to those of the resident population. The economic diversity of the region is very low as indicated by the relatively few export-producing industries in the region. The local governments in the region would not likely be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the region is also very limited.

Environmental Impacts. The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within the Deployment Area. Additional sites may be discovered if a detailed field survey were performed in the Deployment Area. About 2 percent of the Deployment Area is located in a Wilderness Study

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Area. No RARE II areas or experimental ranges/farms are present within the Deployment Area. Five parcels contain National/State forest land, which covers approximately 5 percent of the potential Deployment Area.

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D-9 New Mexico - Central Complex

Following application of the Exclusionary Criteria, Kirtland Air Force Base was identified as a complex based on its solitary geographic location in central New Mexico (Figure D-9).

Application of the Evaluative Criteria to the 14 complexes resulted in the elimination of Kirtland AFB and its potential Deployment Area. The major factors in this determination were that the potential deployment areas are in the direct path of urban growth, are dissected by transportation and utility corridors, or are extremely difficult to access.

The following section elaborates on the performance of the potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

D-9.1 Kirtland Air Force Base, New Mexico

After evaluating the alternatives among the complexes in relation to each other, Kirtland Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were that the potential deployment areas are in the direct path of urban growth, are dissected by transportation and utility corridors, or are extremely difficult to access.

Kirtland AFB is located in central New Mexico, adjacent to Albuquerque, the largest city in the state (Figure D-9). The base is a training center for the 1606th Air Base Wing and is operated by the Military Airlift Command. Sandia National Laboratories is located on Kirtland AFB.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Kirtland AFB would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of 707 square miles of suitable area within 14 parcels. The parcels range in size from 8 to 186 square miles.

Security concerns within the potential Deployment Area would be low due to the overall density of inhabited

structures. The distribution of utility and transportation corridors affects portions of the potential Deployment Area, causing additional security concerns.

System Operability: The operational efficiency of the Main Operating Base would be enhanced because the base is adjacent to the community of Albuquerque (population 418,208), which could supply a wide range of goods and services. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel area(s) selected for siting and its distance from the Main Operating Base. Distances to parcel areas range from 10 to 54 road miles and average 34 road miles. These distances could hamper maintenance operations.

Sufficient land is available for facility expansion, including Weapons Storage Area/Stage Storage Area facilities. Existing facilities are fully occupied, and no mission loss is expected that would increase the availability of facilities to support the Hard Silo mission. On-base, 49 percent of the land is DoD fee owned, 35 percent is land withdrawn for military use, 14 percent is DoE owned, and 2 percent is owned by the city of Albuquerque (runways).

The utility infrastructure at Kirtland AFB is adequate for present base operations, although some utilities

might require upgrading and expansion to support the Hard Silo mission. Electric power is provided by the Public Service Company of New Mexico. Present usage is at about 80 percent of capacity, and the proximity to the large community of Albuquerque suggests that there is a high potential for expansion. Natural gas is provided by the Gas Company of New Mexico. Potential for expansion is high, because the base is supplied by a reliable source. Base waste water is treated in a city plant, although a small part of the base waste water can be treated at a small on-base plant. The existing system is adequate for current demand, but expansion of on-base facilities would be needed to support the Hard Silo mission. Solid waste is disposed of on base in a landfill that is expected to be filled to capacity by 1995. Expansion of this facility or new development would be required to accommodate the Hard Silo mission. The base storm drainage system appears less than adequate for present use; the system drains into Albuquerque's storm drainage system, which floods periodically. Additional ground water and surface water could be developed through purchase/transfer of existing water rights. All ground-water basins in the area are designated by the state. The poor quality of water in some areas would require more than conventional treatment prior to domestic use.

Kirtland AFB has a complete transportation network. The base shares aircraft runways with the Albuquerque International Airport, which has a fully instrumented, 13,373-foot runway and several smaller runways. The road network includes Interstate Highways 25 and 40, which are approximately 1 mile west of the base and 2 miles north of the base, respectively. Urban congestion can create minor problems in access from the highways to the base via city streets. The base is served by two railroad spurs (one owned by the USAF, one by the DoE) that connect to the Santa Fe railroad.

Because Kirtland AFB is an Air Force installation, the existing logistic and personnel support systems should be compatible with the Hard Silo system.

The support services for Kirtland AFB are good, as indicated by the availability of housing and the proximity to a support community. On-base housing occupancy rates range from about 80 percent for transient spaces to 97 percent for family housing. Off-base housing is available for both rental and sale at moderate rates in the adjacent community of Albuquerque, but rapid growth of the urban population may limit future housing supplies.

System Practicability: Construction aggregate is available through purchase and/or direct development.

Aggregate sources are distributed throughout the region. Adverse terrain occurs in 9 percent of the potential Deployment Area. This condition may impose siting constraints and can increase construction and security surveillance costs. Within the Deployment Area, sufficient ground water to support system construction and operations is likely available through purchase/transfer of existing water rights. Poor water quality in some areas may limit its use for construction without more than conventional treatment. Surface water is potentially available to suitable area parcels near the Rio Grande through purchase/transfer of existing water rights. Water quality would be locally, and perhaps seasonally, limiting, and the water may require more than conventional treatment for construction use.

Public Impacts: The potential for land-use conflicts in the potential Deployment Area is low. The parcels contain no timberland. Only one parcel contains agricultural land, which affects less than 1 percent of the potential Deployment Area, and none of the land is classified as prime and unique farmland. Future land-use development trends are expected to have a very limited effect on the potential Deployment Area. Approximately 12 percent of the townships in the Deployment Area have 20 percent or more area under

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energy or mineral claim/lease. However, high value mineral or known energy resource areas do not occur in any of these townships.

A total of 24 square miles of on-installation suitable area occurs on Kirtland AFB. However, approximately half of the on-installation suitable area is presently developed. There are no other DoD/DoE installations containing suitable area parcels within 50 miles of Kirtland AFB, thus limiting the potential for Hard Silo deployment on DoD/DoE installations within 50 miles of Kirtland AFB. The Deployment Area is predominantly privately owned land, with small areas of DoD land, BLM land, and state owned land.

Transportation and utility corridors affect about 37 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. A limited impact on water availability in the support community of Albuquerque is likely to occur due to the increase in population from project workers and their dependents. Ground water could potentially be obtained through purchase/transfer of existing rights. Water quality would be locally limiting and the water may require more than conventional treatment prior to domestic use.

Natural hazards in the Deployment Area are considered minimal. Approximately two percent of the potential

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Deployment Area is located within known 100-year floodplains. Public safety concerns should be minimal due to the low percentage of area within the Deployment Area that contains inhabited structures.

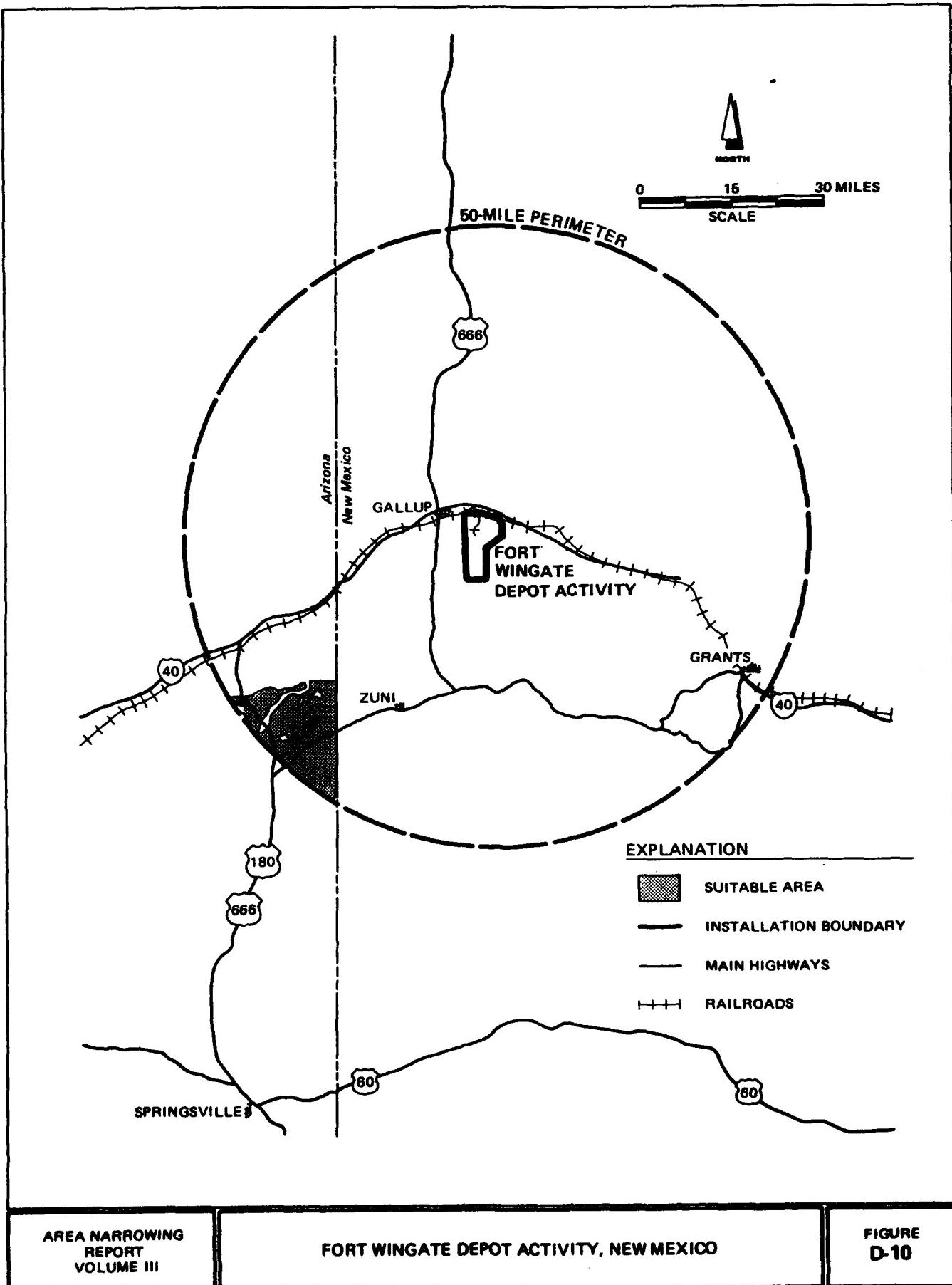
Although the city of Albuquerque can provide a wide range of goods and services, the region of influence has a relatively low population and the outlying areas have only limited goods and services for support of system construction and operation. Nonagricultural employment is low, which increases the likelihood of immigration of project-related workers. Relatively few persons in the region are employed in the construction and military sectors, which means that immigrant workers will more likely have backgrounds dissimilar to those of the resident population. The economic diversity of the region is relatively high, as indicated by the large number of export-producing industries in the region. Local governments in the region would not likely be able to capture tax revenues in the short term to address potential expenditure demands. Although Albuquerque is able to provide moderate amounts of housing, the region overall is unable to provide sufficient housing.

Environmental Impacts: Two suitable area parcels are in nonattainment for at least one major air pollutant.

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The 12 remaining parcels are in attainment for all major air pollutants. Activities within the potential Deployment Area would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within the Deployment Area. The potential for discovery of additional sites is likely if a detailed field survey were performed. No parcels contain Wilderness Study Areas, RARE II areas, or experimental ranges/farms. National/State forest lands are present in one small parcel and affect less than 1 percent of the potential Deployment Area.

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D-10 New Mexico - Western Complex

Following application of the Exclusionary Criteria, Fort Wingate Depot Activity was identified as a complex based on its solitary geographic location in northwestern New Mexico (Figure D-10).

Application of the Evaluative Criteria to the 14 complexes resulted in the elimination of Fort Wingate Depot Activity and its potential Deployment Area. The major factors in this determination were the limited deployment area and its distance from the base, and the lack of support services in the immediate vicinity.

The following section elaborates on the performance of the potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

D-10.1 Fort Wingate Depot Activity, New Mexico

After evaluating the alternatives among the complexes in relation to each other, Fort Wingate Depot Activity (DA) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment.

Major influences in this determination were the limited deployment area, its distance from the base, and the lack of support services in the immediate vicinity.

Fort Wingate DA is located in northwestern New Mexico, 10 miles southeast of the city of Gallup and approximately 130 miles west of the city of Albuquerque (Figure D-10). Fort Wingate is used as an ordnance supply depot under the command of the Army through Tooele Army Depot.

System Effectiveness: The size of the suitable area parcels would provide moderate options for siting the Hard Silo system. The potential Deployment Area has one suitable area parcel that contains 174 square miles. The parcel is located southwest of Fort Wingate DA, entirely within the state of Arizona.

Security concerns within the potential Deployment Area would be minimal because of the low density of inhabited structures. Transportation and utility corridors affect portions of the suitable area parcel,

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causing minimal security concerns.

System Operability: The operational efficiency of Fort Wingate as a Main Operating Base would be degraded by the excess distance (130 miles) to Albuquerque, the nearest support community that can supply a wide range of goods and services. The city of Gallup, located about 10 miles west of the base, has a relatively small population and few support services. Accessibility of the potential Deployment Area to maintenance facilities at a Main Operating Base is dependent upon the distance of the parcels from the base. The single parcel is located 66 road miles from the base. This distance could hamper maintenance operations.

Fort Wingate DA contains sufficient land for new support facilities, including Weapons Storage Area/Stage Storage Area facilities, and off-base expansion is also feasible. The base does not expect a mission loss that would increase the availability of existing facilities for use by the Hard Silo mission. On-base land is 100 percent DoD fee-owned.

The utility infrastructure at Fort Wingate is adequate for present base operations with additional capacity of most utilities. Electrical power is presently supplied by the Gallup Electric Power Company. Additional

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demand on existing facilities can be accommodated. Heating is provided by natural gas supplied by the Gas Company of New Mexico. The heating system expansion capacity is unknown, but the proximity to a nearby community suggests that there is potential for expansion. The base waste-water treatment plant is extremely under-utilized. The system can easily accommodate additional demand. Domestic waste is hauled by contract to the Gallup city landfill. Installation construction materials and debris are disposed of in an on-base landfill that will reach its capacity in 1991. The base storm drainage system appears adequate for historic drainage demands. The administration area is drained by an underground storm drainage system supplemented by open culverts and channels. Sufficient water for deployment and operation of the Hard Silo system may be available for purchase/transfer from existing sources. However, the ground-water basin containing Fort Wingate DA has been declared by the state to provide for a power generating plant under construction near the base. The installation's present water needs are extremely low. The anticipated demand by the Hard Silo system would significantly change the present demand. Ground-water quality is locally poor and water may require more than conventional treatment prior to domestic use.

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The Fort Wingate DA transportation system is limited by the lack of airfield facilities on base. The nearest airstrip is about 7 miles east of the base at Penea and its length and instrumentation status are unknown. The city of Gallup has an uninstrumented municipal airport. Railroad access to the base is provided by an on-base siding connected with a Santa Fe Railroad main line, which runs adjacent to the northern boundary of the base. Highway access is provided by Interstate Highway 40, located adjacent to the northern boundary of the base.

Because Fort Wingate DA is an Army base, the existing logistic and personnel support services would need to be augmented to be compatible with Air Force operations.

The support services for Fort Wingate are limited, as indicated by the availability of housing and proximity to a community. Limited amounts of housing are present on base, and all quarters are fully occupied. Off-base housing is scarce, because demand exceeds supply and property is moderately high priced. The largest community within 25 miles of the base is Gallup (population of approximately 18,000), which could provide only limited goods and services.

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System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are distributed throughout the region. Nine percent of the Deployment Area contains adverse terrain. This condition may impose some system siting constraints and can increase construction and surveillance costs. Additional ground water could be developed within the Deployment Area to support construction of the Hard Silo system. Ground-water quality is locally poor and may require more than conventional treatment prior to domestic use.

Public Impacts: Land-use compatibility concerns in the potential Deployment Area are minimal. There is no agricultural land, prime and unique farmland, or timberland in the suitable area parcels. None of the townships in the Deployment Area have 20 percent or more area under energy or mineral claim/lease. There are no known high value mineral or energy resource areas in these townships. Future land-use development plans and trends are not expected to affect the potential Deployment Area.

The lack of on-installation suitable area within 50 miles of Fort Wingate precludes the potential for Hard Silo deployment on DoD/DoE installations. The Deployment Area occurs entirely on private land.

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Transportation and utility corridors have a minimal effect on siting the Hard Silo system, because only 5 percent of the potential Deployment Area is affected by these siting concerns. The domestic water demands by an immigrant work force and their families upon the region around Fort Wingate is likely to have a moderate effect on water availability. Ground and surface water may be available through purchase/transfer of existing water rights. However, the ground water basin has been declared by the state to provide for a power-generating station under construction near Gallup. Poor water quality may limit its availability for domestic use without more than conventional treatment. In the distant support community of Albuquerque, a limited impact on water availability is likely to occur. Ground water could potentially be developed in Albuquerque through purchase/transfer of existing rights.

Natural hazards in the potential Deployment Area are minimal. Four percent of the Deployment Area is located within known 100-year floodplains. Public safety concerns should be minimal due to the relatively small number of inhabited structures in the Deployment Area.

Deployment of the Hard Silo system at Fort Wingate DA could raise social and economic concerns in the

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community of Gallup, if it were to absorb the influx of support personnel and dependents. The 130 road miles to Albuquerque, the nearest support community, makes it unlikely that it would receive any of the expected influx of personnel and dependents. The urban population of the region is low, indicating that it cannot provide many goods and services.

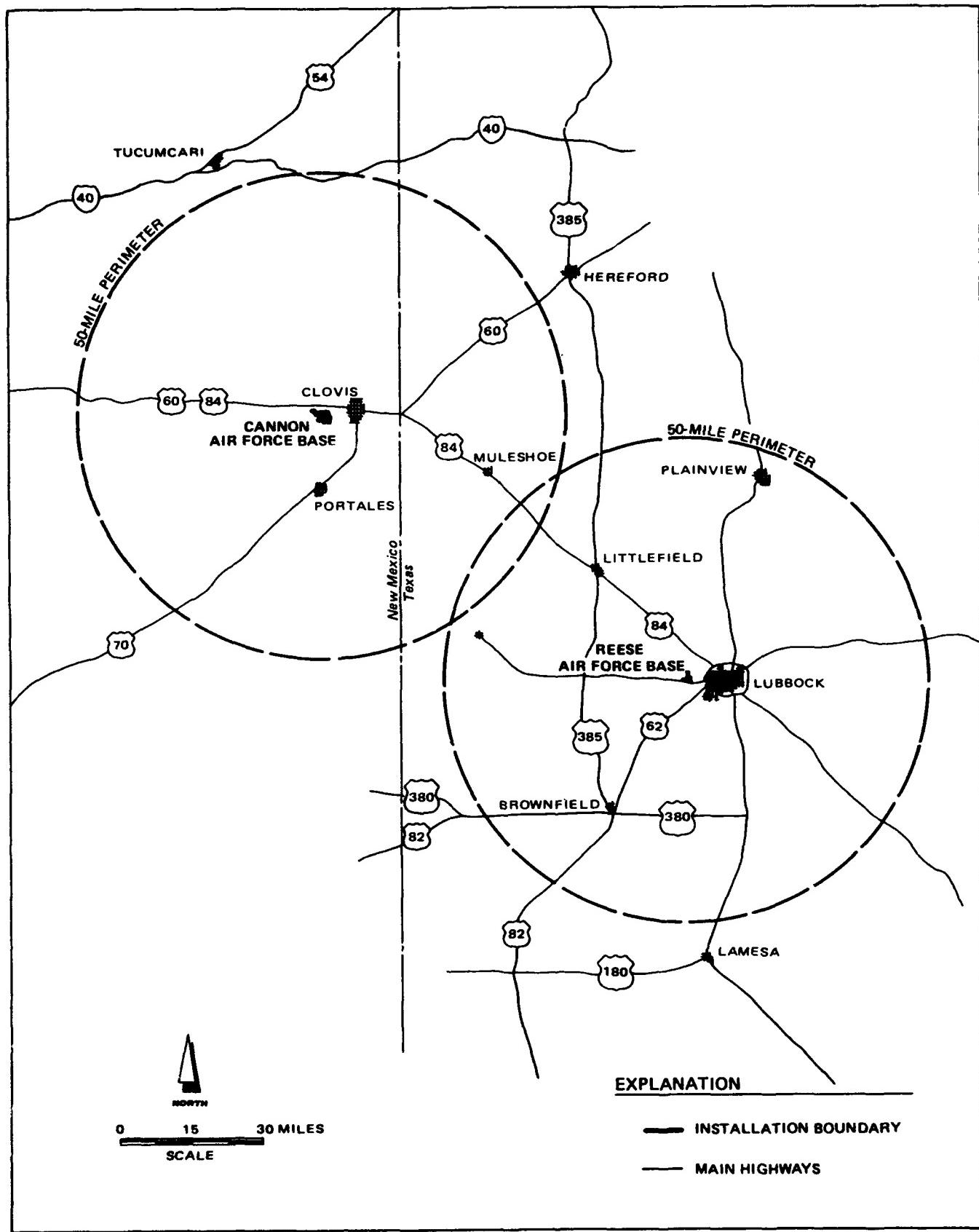
Nonagricultural employment in the region is also low, which increases the likelihood of immigration of project-related workers. In addition, the number of persons working in the construction and military sectors is low, which means that new workers and military personnel are likely to have backgrounds dissimilar to those of the resident population. The economic diversity of the region is relatively low as indicated by the number of export-producing industries in the region. Local governments in the region would not likely be able to capture tax revenues in the short term to address potential expenditure demands. The number of available housing units in the region is very limited.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the Deployment Area would be unlikely to affect any Prevention of Significant Deterioration Class I areas. No cultural resource sites listed in

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the National Register of Historic Places are located within the Deployment Area. Based on the cultural history of the region, discovery of these types of cultural resource sites is possible if a detailed field survey were performed. The potential Deployment Area contains no Wilderness Study Areas, RARE II areas, experimental ranges/farms, or National/State forest land.

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NEW MEXICO/TEXAS – NORTHERN COMPLEX

FIGURE
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D-11 New Mexico/Texas - Northern Complex

Following application of the Exclusionary Criteria, Cannon Air Force Base and Reese Air Force Base were grouped into a complex (Figure D-11).

Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of Reese AFB.

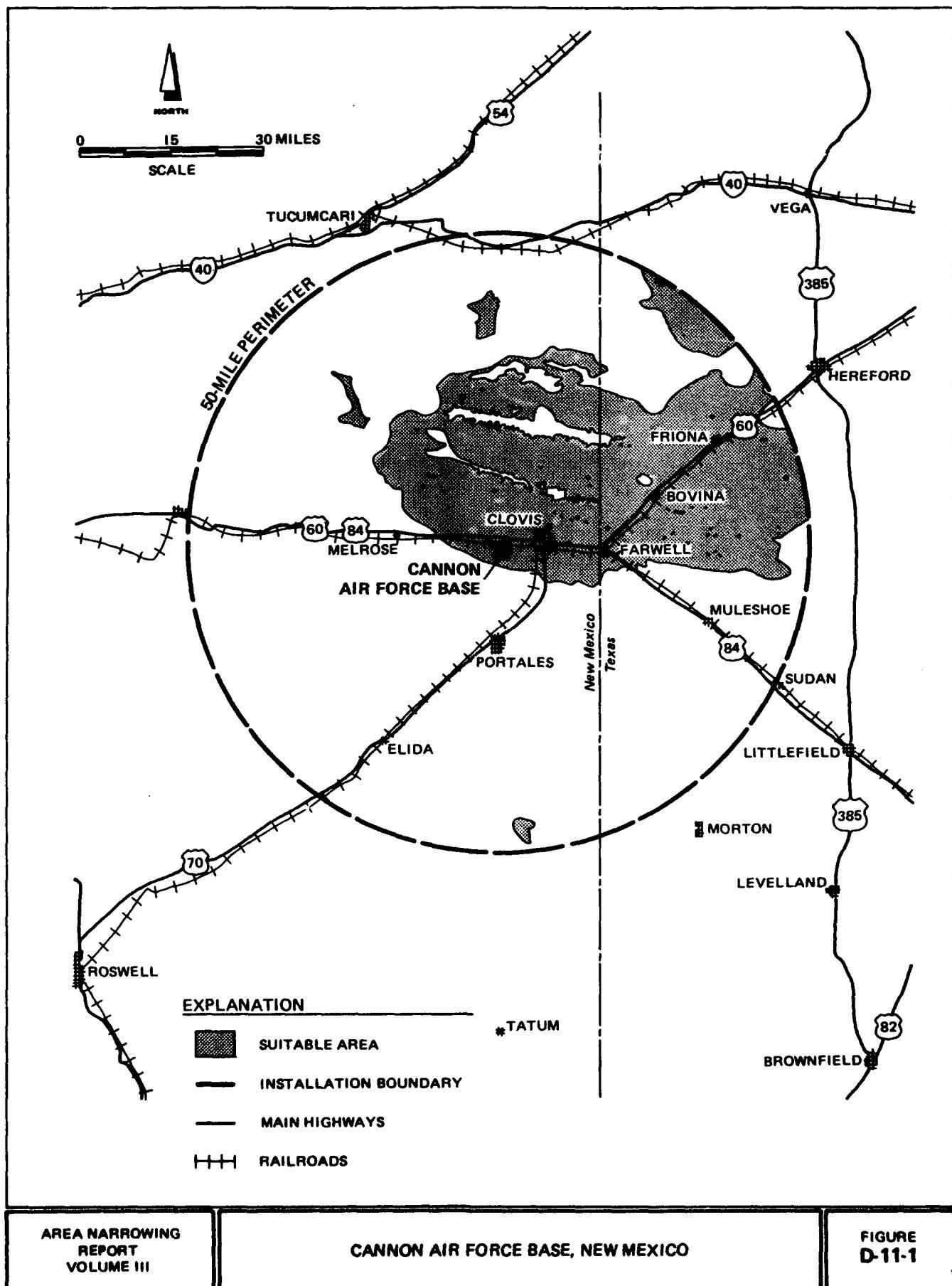
Application of the Evaluative Criteria to the 14 complexes resulted in the elimination of Cannon AFB and its potential Deployment Area. The major factors in these determinations were:

Cannon Air Force Base - intense agricultural development within the potential deployment area, much of which has been declared prime and unique farmland; sensitivity to further overdrafting of the water supply; and the limited support services available in the immediate vicinity.

Reese Air Force Base - intense agricultural development within the potential deployment area, much of which has been declared prime and unique farmland; the distance to the deployment area; and the limited land available on base for facility expansion.

The following sections elaborate on the performance of each potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

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D-11.1 Cannon Air Force Base, New Mexico

After evaluating the alternatives among the complexes in relation to each other, Cannon Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the intense agricultural development within the potential Deployment Area, much of which has been declared prime and unique farmland, and the sensitivity to further overdrafting of the water supply. Another contributing factor was the limited availability of support services in the immediate vicinity.

Cannon AFB is located in east-central New Mexico, approximately 4 miles west of Clovis and 15 miles west of the New Mexico/Texas border (Figure D-11-1). The base is operated by the Air Force Tactical Air Command and is the home of the 27th Tactical Fighter Wing. Cannon AFB also provides replacement training aircrews for tactical operations worldwide.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Cannon AFB would provide many options for siting the Hard Silo system. The potential Deployment Area consists of five suitable area parcels that contain a total of 1,869

square miles. The largest parcel contains 1,739 square miles.

Security concerns within the potential Deployment Area would be moderate due to large areas that contain a low density of inhabited structures. Transportation and utility corridors affect portions of the Deployment Area and cause additional security concerns.

System Operability: The efficiency of the Main Operating Base activities of Cannon AFB would be enhanced by the close proximity (4 miles) of Clovis, which can provide a moderate range of goods and services. Accessibility to base maintenance facilities from the potential Deployment Area is dependent upon the final parcel(s) selected and its distance from the Main Operating Base.

The base does not anticipate a mission loss that would increase the availability of existing facilities for the Hard Silo mission. Cannon AFB has some land available for new facilities to support the Hard Silo mission; however, there are land-use conflicts and limited flexibility for siting Weapons Storage Area/Stage Storage Area facilities. Presently, 84 percent of the land on base is DoD fee owned.

The utility infrastructure supporting the base is adequate for present use, but will require considerable

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expansion and/or new development to accommodate the Hard Silo mission. Additional electrical power capacity is potentially available; however, new transmission facilities would be required. Heating is currently being provided by natural gas supplied by the Gas Company of New Mexico and additional gas supply is readily available. Waste-water treatment for the base is provided on base by lagoons; these facilities are presently underutilized and could be expanded. Solid waste is presently disposed of by private contractors in an off-base landfill operated by the city of Clovis. The base storm drainage system consists of a network of underground drains and open ditches that appears adequate to handle present runoff but may require upgrading and expansion of the system if additional facilities are constructed.

Water requirements for agriculture in the area have placed the local ground-water basin in an overdraft condition. The result has been a shift in land use from agriculture to grazing because continued ground-water development is not economical or feasible. It is likely that direct development of ground water could meet on-base project water requirements but there would likely be increased sensitivity to the further overdrafting of the aquifer. Hard Silo mission-related overdrafting of the ground-water basin would further

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exacerbate the local agricultural problems. Both surface and ground water are locally of poor quality and would require more than conventional treatment prior to domestic use. Significant expansion of existing on-base water-supply facilities would be required.

Cannon AFB has a very good transportation system. The base has a 10,000-foot, fully instrumented runway. U.S. Highway 60/84 is located just north of the base and U.S. Highway 70 is 5 miles east of the base. Rail service is provided by the Santa Fe Railroad at Clovis. A spur from the Santa Fe line enters the base east of the main entrance.

Because Cannon AFB is an Air Force administered installation, the logistic and personnel support systems would be compatible with the Hard Silo mission.

The support services for Cannon AFB are moderate, as indicated by the availability of housing and the proximity to a support community. On-base housing is extremely limited, with a 98 percent occupancy rate. Off-base rental properties and housing are available at reasonable rates but could not meet the expected project-related demand for housing in the support community of Clovis, which is 4 miles from the base.

System Practicability: Construction aggregate is available through purchase and/or direct development of sources in the region. Adverse terrain, which affects 1 percent of the potential Deployment Area, will impose minimal system siting constraints. It is likely that ground water is available for system construction and operation through direct development in the potential Deployment Area. Overdrafting would continue and may increase local problems associated with this condition. Surface water may be available through purchase/transfer in some areas. The quality of both surface and ground water is locally poor and the water will require more than conventional treatment prior to use.

Public Impacts: Potential land-use conflicts from deployment of the Hard Silo system are moderate. Approximately 85 percent of the Deployment Area lies within agricultural lands, with 75 percent of these lands classified as prime and unique farmland. The Deployment Area contains no timberland. Presently, 67 percent of the townships within the Deployment Area have greater than 20 percent claim/lease coverage for energy and mineral resources; however, no known high value minerals occur in these townships. Known energy resource areas are present in very few townships.

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There is no suitable area contiguous to Cannon AFB, or on other DoD/DoE lands within 50 miles of the base. The Deployment Area occurs predominantly on private land and some scattered areas of state owned land.

Transportation and utility corridors affect approximately 33 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. The potential water demand of an induced work force and their families will have some affect on water availability in the support community. Significant expansion of the water-supply system would be required to meet increased demands. Ground water could potentially be developed, but the limited surface-water supply systems could probably not be expanded. Ground water and surface water are locally of poor quality and may require more than conventional treatment prior to domestic use.

Natural hazards in the potential Deployment Area are minimal. Only 3 percent of the land is located within identified 100-year floodplains. Large areas within the Deployment Area contain a low density of inhabited structures, posing greater safety concerns in those areas.

The small community of Clovis could be significantly affected if it were to absorb the influx of support

personnel and dependents. The low regional population indicates that limited goods and services would be available. Nonagricultural employment in the region is also low, which increases the likelihood of immigration of project-related workers. Low employment in the construction and military sectors suggests that any new workers will likely have backgrounds dissimilar to those of the resident population. The region has comparatively few export-producing industries, which indicates low economic diversity. Local governments in the region should be able to capture tax revenues over the short term to address potential expenditure demands. Housing availability in the region is limited. The cities of Clovis and Portales could alleviate some of the negative regional characteristics because of their proximity, but only to a limited extent.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants. Activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Several archaeological sites have previously been identified within the Deployment Area. The significance of these sites has yet to be determined and therefore none of the sites

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are listed in the National Register of Historic Places. Additional cultural resource sites may be discovered if a detailed field survey were performed in the potential Deployment Area. Wilderness Study Areas, RARE II areas, National/State forests lands, and experimental ranges/farms do not occur within the potential Deployment Area.

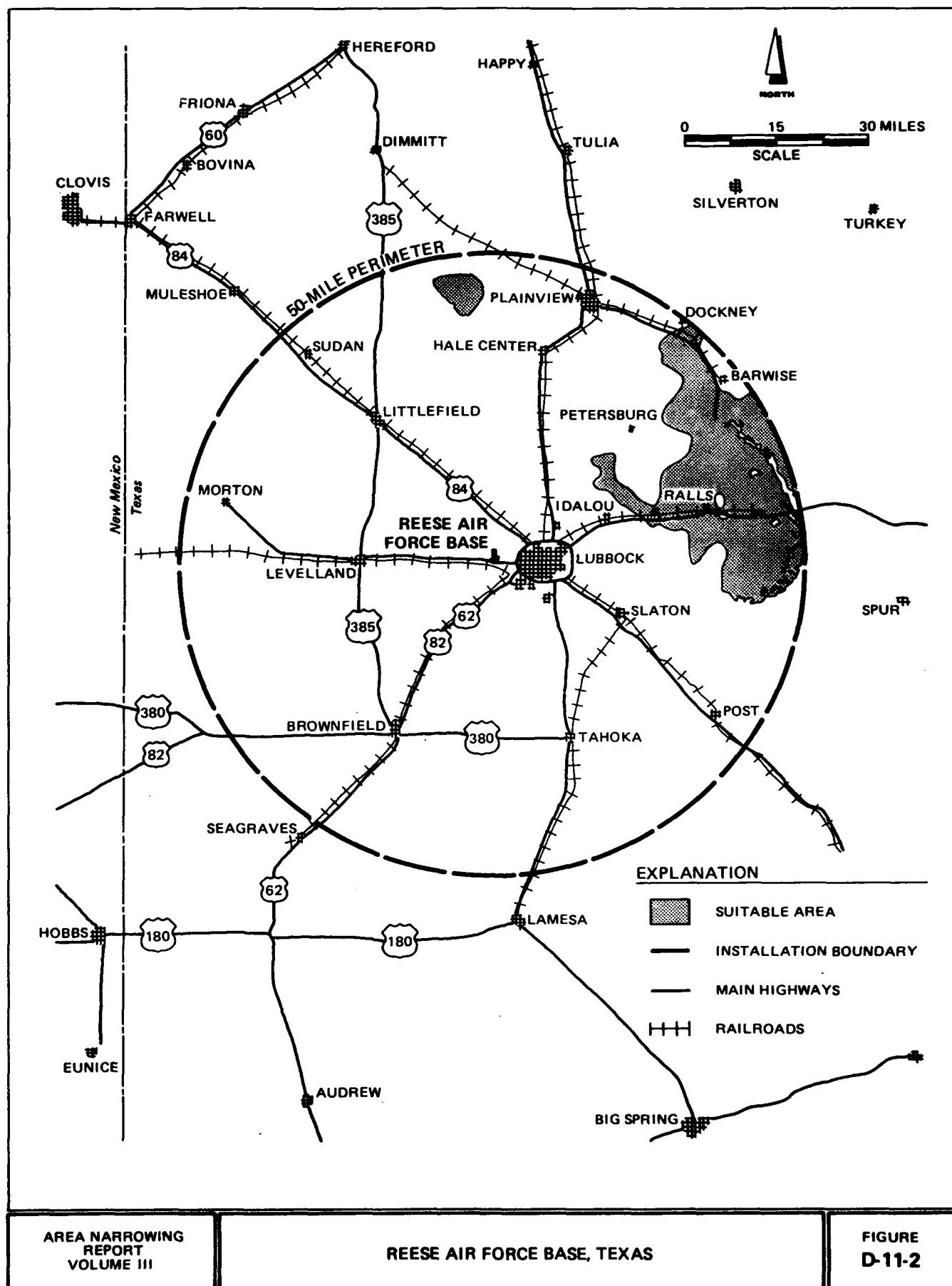
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D-11.2 Reese Air Force Base, Texas

After evaluating the alternatives within the complex in relation to each other, Reese Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the intense agricultural development within the potential Deployment Area, much of which has been declared prime and unique farmland, the distance from the base to the potential Deployment Area, and the limited land available on base for facility expansion.

Reese AFB is located in the Texas panhandle, approximately 7 miles west of the city of Lubbock (Figure D-11-2). The base is a pilot training installation operated by the Air Training Command of the Air Force.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Reese AFB would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of two suitable area parcels containing 33 and 630 square miles, located northwest and northeast of the base, respectively.

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The overall density of inhabited structures within the potential Deployment Area would cause some security concerns. Transportation and utility corridors affect a portion of the Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities is enhanced by the short distance (7 road miles) to Lubbock. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to the two parcels from the base are 48 and 49 road miles. These distances could hamper maintenance operations.

Surplus land to support new facilities for the Hard Silo mission, including Weapons Storage Area/Stage Storage Area, is severely constrained. The base is not anticipating a mission loss that would increase the availability of existing facilities for the Hard Silo mission. Off-base expansion is feasible, however, the land north and west of the base is privately owned. All on-base land is DoD fee owned or donated for general military use.

The utility infrastructure at Reese AFB is adequate for present base operations with potential for expansion to

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meet future demands. Electrical power is presently supplied by the South Western Public Service Company and meets present demands. Expanded capacity would require upgrading of the transmission facilities. Heating is currently provided by natural gas which is supplied by Energas Company. The supply of natural gas is believed to be adequate to meet present demands and can be easily expanded. Waste-water treatment is provided on base with sufficient capacity to accommodate additional demands. Solid waste is presently disposed of by private contractors in an off-base landfill operated by the city of Lubbock. The capacity and life expectancy of the city landfill is unknown. The storm drainage system consists of open drains leading to intermittent ponds and streams and some underground drains. Minor flooding during heavy rainstorms indicates that the system may be inadequate to meet present needs and will require upgrading and expansion to support additional facilities. It is likely that there is sufficient surface and ground water available through direct development and/or purchase/transfer to meet the increased base needs of the Hard Silo mission. Overdrafting of the ground-water basin would continue but this practice is not prohibited by state water laws. Significant expansion of existing facilities would be required to

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support the Hard Silo mission. Ground water and surface water may be of poor quality, requiring more than conventional treatment prior to domestic use.

Reese AFB has a good transportation system. The base has two 10,500-foot, fully instrumented, parallel runways and one 6,500 foot runway. The Sante Fe Railroad passes along the southern boundary of the base. A spur and siding lead to Reese AFB but they are not owned by the base. Highway access is provided by U.S. 84 and U.S. 82, running north and south of the base, and State Route 114, which runs along the southern boundary of the base.

Because Reese AFB is an Air Force administered installation, the logistic and personnel support systems would be compatible with the Hard Silo mission.

The support services for Reese AFB are adequate, as indicated by the availability of housing and the proximity to a support community. Housing is very limited on base, because the quarters are 100 percent occupied; however, adequate off-base housing is available at moderate rates in the nearby community of Lubbock. The city of Lubbock (population about 174,000) is the closest community which could provide a wide range of goods and services.

System Practicability: Construction aggregate is available through purchase and/or direct development. Aggregate sources are concentrated in only one portion of the region. Adverse terrain is present in 5 percent of the potential Deployment Area. This condition may impose some system siting constraints and can increase construction and security surveillance costs. It is likely that ground water for system construction and operation is available in the potential Deployment Area through direct development and/or purchase/transfer. Overdrafting of the ground-water basins would continue, but this practice is presently not prohibited by Texas water law. Ground water is of poor quality locally and may require more than conventional treatment prior to some construction uses.

Public Impacts: There is some potential for land-use conflicts from deployment of the Hard Silo system within the potential Reese AFB Deployment Area. Agricultural land covers 90 percent of the potential Deployment Area and 61 percent of the Deployment Area occurs on land classified as prime and unique farmland. Timberlands do not occur in the potential Deployment Area; future land-use development plans and trends are not expected to adversely affect the Deployment Area. Presently, 28 percent of the townships in the Deployment Area have 20 percent or greater area under

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energy or mineral claim/lease. The claim/lease coverage impacts 100 percent of the smallest parcel and 23 percent of the largest parcel. None of these townships have known high value mineral resource areas; however, 9 percent of these townships contain known energy resource areas.

There is no on-installation suitable area within 50 miles of Reese AFB which precludes the potential for Hard Silo deployment on DoD/DoE installations. The Deployment Area is exclusively privately-owned land.

Transportation and utility corridors affect approximately 31 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. A limited effect on water availability in the support community of Lubbock is likely to occur due to the increase in population from project workers and their dependents. Although expansion of the existing water supply system would be required, surface and ground water could be developed to meet the additional needs. Surface and ground water are of poor quality locally and may require more than conventional treatment prior to domestic use.

Natural hazards in the Deployment Area are considered minimal. Small portions of both parcels are located within identified 100-year floodplains, but affect only

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10 percent of the Deployment Area. Large areas of low density inhabited structures will pose some public safety concerns within the Deployment Area.

The region of influence surrounding the base has a relatively small population which implies a limited range of goods and services but the city of Lubbock can provide a reasonably wide range of goods and services. Nonagricultural employment is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is relatively low, which means that new workers will most likely have backgrounds dissimilar to those of the resident population. The economic diversity of the region is good as indicated by the number of export-producing industries in the region. Local governments in the region may not be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the larger region is relatively limited, but Lubbock can provide a considerable amount of housing.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. No cultural resource

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sites listed in the National Register of Historic Places are located within the Deployment Area. Based on the cultural history of the region, these types of sites may be discovered if a detailed field survey were performed in the Deployment Area. None of the Deployment Area contains Wilderness Study Areas, RARE II areas, experimental ranges/farms, or National/State forest land.

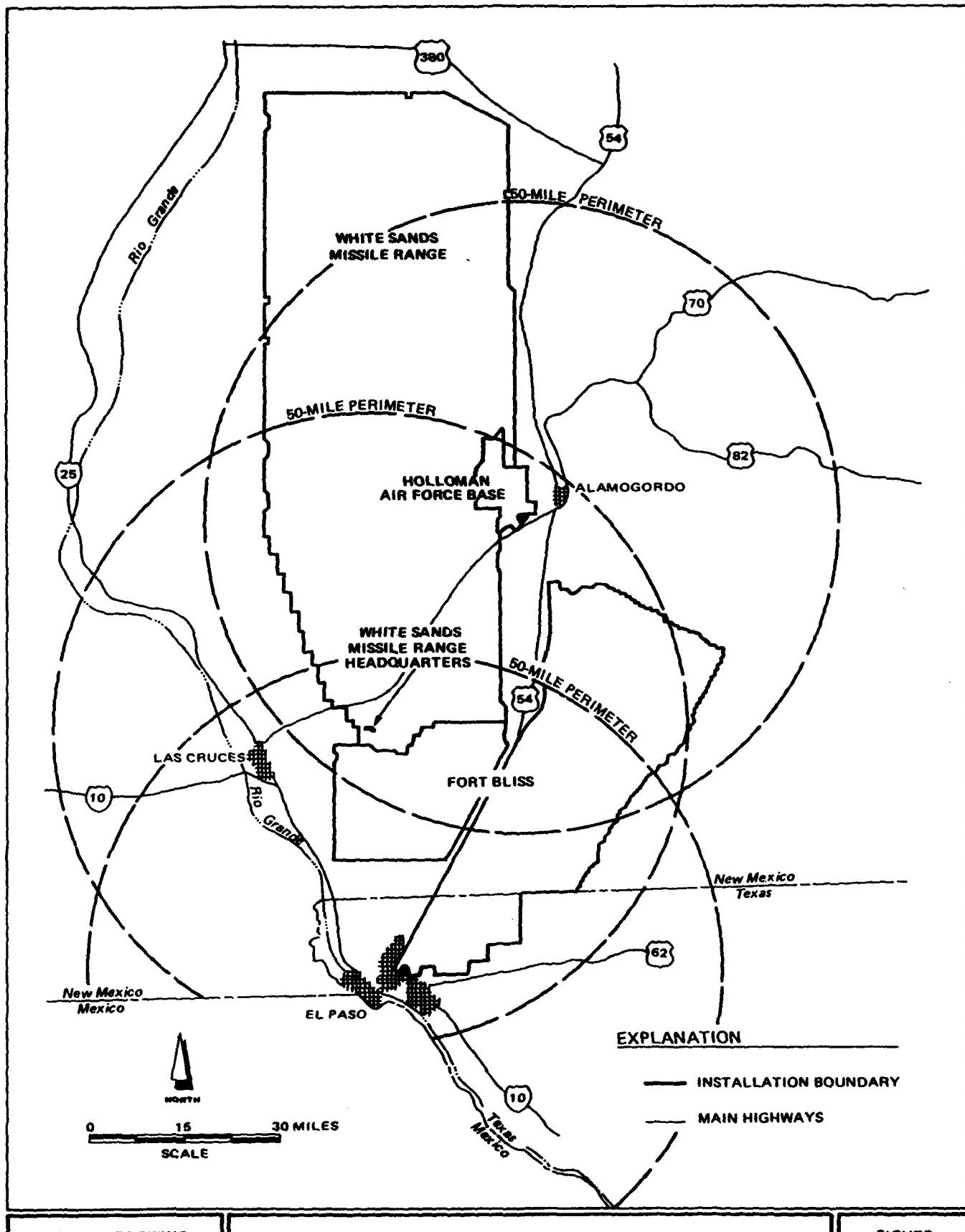
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AREA NARROWING
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NEW MEXICO/TEXAS - SOUTHERN COMPLEX

FIGURE
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D-12 New Mexico/Texas - Southern Complex

Following application of the Exclusionary Criteria, Fort Bliss, Holloman Air Force Base, and White Sands Missile Range Headquarters were grouped into a complex (Figure D-12).

Application of the Evaluative criteria to the bases within the complex resulted in the elimination of all bases except Fort Bliss. In addition, Fort Bliss and its potential Deployment Area remain after application of the Evaluative Criteria to the 14 complexes. No determination has been made at this time regarding the overall advisability of using this Army installation to support an Air Force Strategic Air Command mission.

The major factors in eliminating Holloman AFB and White Sands Missile Range Headquarters were:

Holloman Air Force Base - distance to the potential deployment areas and the existence of another potential base of comparable capability closer to the deployment areas.

White Sands Missile Range Headquarters - existence of another potential base of comparable capability that contains the more feasible deployment areas.

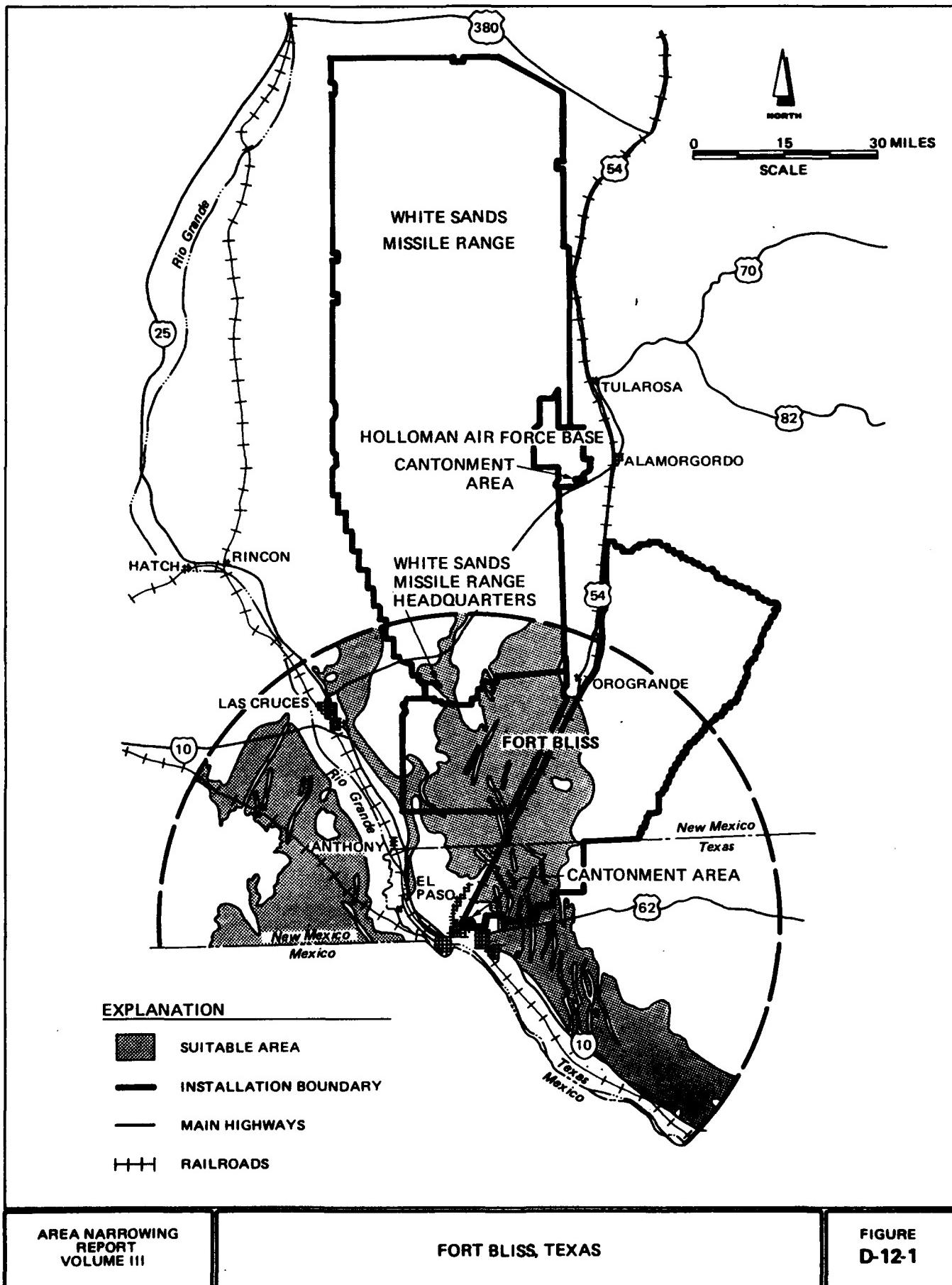
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The following sections elaborate on the performance of each potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

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D-12.1 Fort Bliss, Texas

After evaluating the alternatives among the complexes in relation to each other, Fort Bliss remains for further, more detailed study. As a Main Operating Base, Fort Bliss has favorable characteristics for Hard Silo deployment. The base has land available for on-base facilities expansion, a good transportation system, favorable utility infrastructure, and is close to a large support community. In addition, the potential Deployment Area has large parcels both off base and contiguous with the Main Operating Base.

Fort Bliss is an Army base located in the westernmost portion of Texas, immediately adjacent to the eastern limits of El Paso. The Fort Bliss range extends northeast from El Paso, Texas, into southeastern New Mexico (Figure D-12-1). The base is used as an air defense weapons training center.

System Effectiveness: The size and distribution of the suitable area parcels within 50 radial miles of Fort Bliss would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of four suitable area parcels that contain 1,894 square miles of area. The respective parcels contain 27, 79, 454, and 1,334 square miles of suitable area.

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Security concerns within the potential Deployment Area would be minimal due to the overall low density of inhabited structures within the parcels. Existing transportation and utility corridors affect portions of the potential Deployment Area and cause additional security concerns.

System Operability: The efficiency of Fort Bliss as a Main Operating Base would be enhanced because the support community of El Paso is adjacent to the base. Accessibility of the potential Deployment Area to maintenance facilities at the base is dependent upon the final parcel(s) selected and its distance from the base. Travel distances to the parcels from the base range from 0 to 60 road miles. Although there are parcels adjacent to the base, the average travel distance is 48 road miles, a distance that could hamper maintenance operations.

Land is available for new support facilities, including the Weapons Storage Area/Stage Storage Area facilities. The base does not expect a reduction in operations that would increase the availability of existing facilities for the Hard Silo mission. Ninety-four percent of the available land on Fort Bliss is fee-owned or land withdrawn for military use.

The utility infrastructure at Fort Bliss is adequate for present base operation with a good potential for

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expansion to meet future demands. Electrical power is presently supplied by the El Paso Electric Company and the system has excess capacity. Heating is provided by the El Paso Natural Gas Company; supplies are more than adequate to meet present and future demand. The El Paso waste-water treatment plant serving the base has a 2.85 million gallon-per-day excess capacity. The present landfill site serving the base is more than adequate to meet future needs. The base storm drainage system may not be adequate to support expanded use without installation of additional facilities. It is questionable whether sufficient ground water is available to support new facilities for the Hard Silo mission. The base is located in a state-declared ground water basin and ground-water litigation is presently ongoing. Ground water may be of poor quality locally and may require more than conventional treatment prior to domestic use. An alternative source of water may be through the purchase of surface-water rights to the Rio Grande River.

Fort Bliss has a complete transportation network. The base has a 13,555-foot, fully instrumented runway and is within 3 miles of El Paso International Airport. An on-base rail spur connects with the Southern Pacific Railroad. Highway access to the base is provided by Interstate Highways 10 and 25, which are less than 1

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and 10 miles away, respectively.

Because Fort Bliss is an Army installation, the existing logistic and personnel support systems would need to be augmented for compatibility with an Air Force mission.

Fort Bliss has good support services, as indicated by the size and proximity of the nearest population center and the availability of housing on and adjacent to the base. The Fort Bliss cantonment area is adjacent to El Paso, which has a population of approximately 454,000, providing extensive support services. Although some on-base housing may be available, additional housing would be required to accommodate the Hard Silo system personnel and their dependents.

System Practicability: Construction aggregate is available to support the construction program through direct development and/or purchase from sources distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints. Adverse terrain, which can increase construction and security surveillance costs, is present in 27 percent of the potential Deployment Area.

The availability of surface water for most of the potential Deployment Area is questionable. Use of the

area's only major surface-water source (Rio Grande) would require purchase of existing water rights. Ground-water availability is highly variable and all suitable area parcels are located in declared underground water basins. In addition, some parcels are located in an area where ground-water use is in litigation. Poor quality of ground-water may limit its uses for construction without more than conventional treatment.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the Fort Bliss Deployment Area is low. There is less than 1 percent agricultural lands, no prime and unique farmlands, and no timberlands in the potential Deployment Area. Future land-use development plans and trends are not expected to adversely affect the use of the potential Deployment Area. Approximately 96 percent of the townships in the potential Deployment Area have 20 percent or more area under energy or mineral claim/lease. However, high value mineral or known energy resource areas do not occur in these townships.

A total of 743 square miles of suitable area, or 39 percent of the potential Deployment Area, occurs on DoD installations within 50 miles of Fort Bliss. This

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amount of area provides numerous options for Hard Silo deployment. The remainder of the Deployment Area is located predominantly on federally administered (BLM) land.

Transportation and utility corridors may affect the degree of flexibility available to site the Hard Silo system. Approximately 27 percent of the potential Deployment Area is affected by these corridors.

The increased water demand in support of the Hard Silo system could affect the local communities. The state-declared ground-water basin is currently in overdraft and water use is in litigation. Alternative water sources may need to be developed or existing water rights transferred/purchased to meet the deployment and operational needs of the Hard Silo system.

Natural hazards within the potential Deployment Area are considered minimal. Three percent of the Deployment Area is located within identified 100-year floodplains. The local concern for public safety should be minimal due to the sparse areas of inhabited structures within the potential Deployment Area.

Deployment of the Hard Silo system could raise social and economic concerns in the El Paso and Las Cruces

areas. Although these nearby communities can provide a wide range of goods and services, the region and outlying areas have a relatively low urban population, implying limited goods and services for support of system construction and operation. Nonagricultural employment in the region is also low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is moderate, which means that new workers will likely have backgrounds similar to those of the resident population. The economic diversity of the region is good, as indicated by the number of export-producing industries in the region. Local governments in the region would likely be able to capture tax revenues in the short term to address potential expenditure demands. Although the availability of housing in the El Paso and Las Cruces communities is good, housing availability in the region is relatively limited. The proximity of the two communities to the base could offset some of the comparative regional disadvantages.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants, with the exception of two parcels, which are in non-attainment for at least two major pollutants. Activities within

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the potential Deployment Area would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Discovery of additional sites is possible if a detailed field survey were performed in the potential Deployment Area. The potential Deployment Area contains no Wilderness Study Areas, RARE II areas, or National/State forest lands. One percent of the potential Deployment Area is occupied by the Jornada Experimental Range.

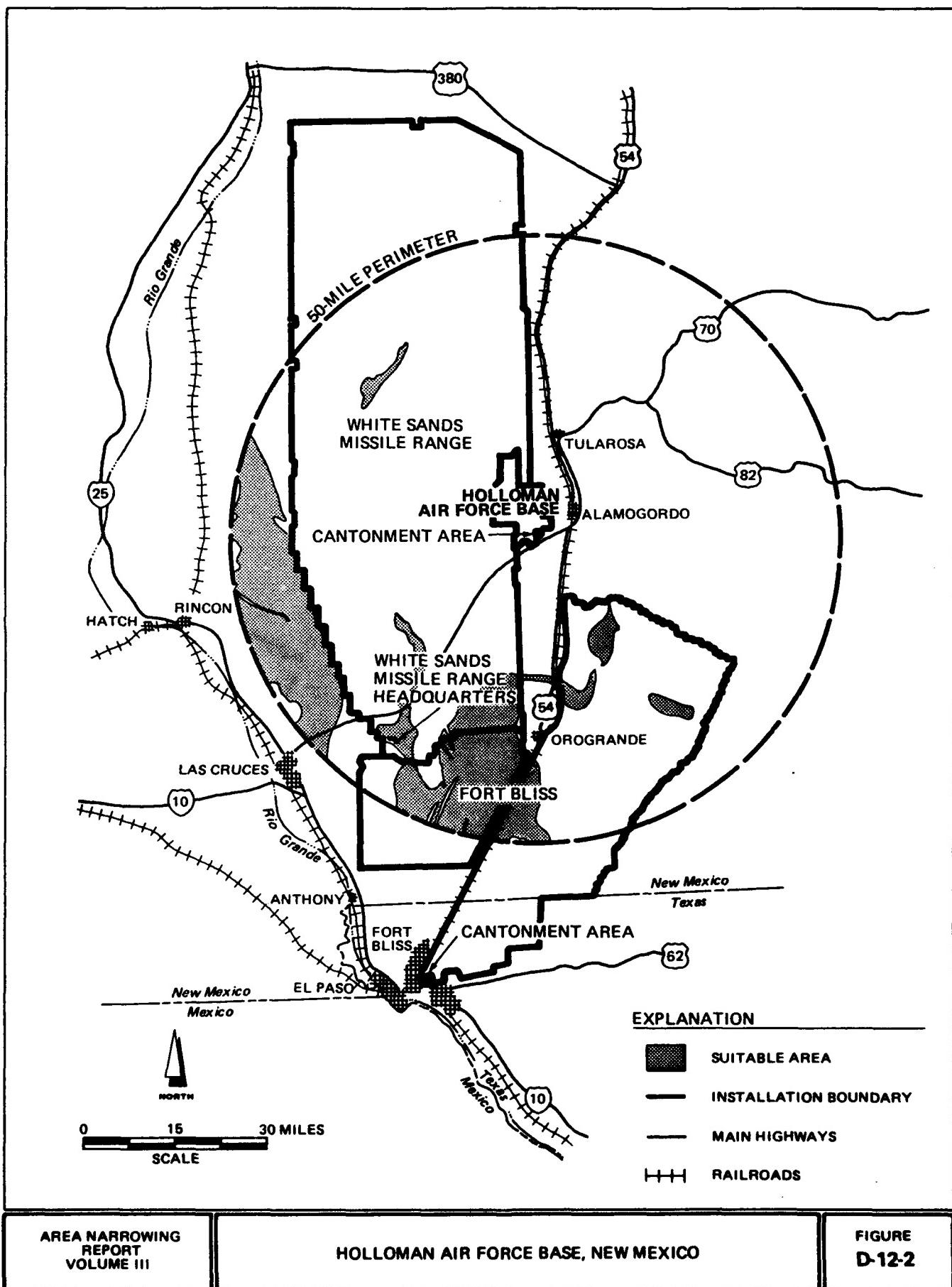
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D-12.2 Holloman Air Force Base, New Mexico

After considering the alternatives within the complex in relation to each other, Holloman Air Force Base (AFB) was eliminated from further study. The potential Main Operating Base/ Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the distance from the base to potential Deployment Areas and the existence of another potential base of comparable capability closer to the Deployment Areas.

Holloman AFB is located in south-central New Mexico, 5 miles west of Alamogordo, 15 miles southwest of Tularosa, and about 90 miles north of El Paso, Texas (Figure D-12-2). The base adjoins portions of the White Sands Missile Range along its west, north, and east boundaries. Holloman AFB is presently used for tactical fighter training, tactical fighter combat preparedness, and includes a combat support group.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Holloman AFB would provide numerous options for siting the Hard Silo system. The potential Deployment Area consists of four parcels, which total 975 square miles of suitable area. The parcels range in size from 13 to 922 square miles.

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Security concerns within the potential Deployment Area would be minimal due to the density of isolated inhabited structures. Existing transportation and utility corridors affect portions of the Deployment Area, causing minimal security concerns.

System Operability: The efficiency of Main Operating Base activities would be enhanced by the short distance (5 road miles) to Alamogordo, the nearest community that could provide a wide range of goods and services to the base. The accessibility of the potential Deployment Area to maintenance facilities at the base is dependent upon the final parcel(s) selected for siting and its distance from the base. Distances to suitable parcels range from 30 to 62 road miles. The average travel distance of 48 road miles could hamper maintenance operations.

Sufficient area is available on Holloman AFB for the Hard Silo support facilities, including the Weapons Storage Area/Stage Storage Area facilities. The base does not anticipate a major mission change that would make its relatively large number of support facilities and services more available to support the Hard Silo mission. Land on Holloman AFB is 93 percent DoD fee-owned and land withdrawn for military use.

The utility infrastructure at Holloman AFB is adequate for current operations, with some potential for expansion to

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meet Hard Silo requirements. Electrical power is supplied by the El Paso Electric Company, with additional power for 600 base housing units supplied by the Otero Electric Company. The capacity of the electrical supply system is more than adequate for present base needs. Natural gas is supplied by the Gas Company of New Mexico, with adequate capacity to handle the present base needs and potential for handling increased demands. Holloman AFB is served by a 2.2 million gallons-per-day waste-water treatment plant that has a 47 percent excess capacity over present demand. Solid wastes are disposed of at an on-base sanitary landfill site; an additional area has been set aside for future use. The storm drainage system is generally adequate for existing facilities, although some flooding in the base housing area has occurred. Ground water to support new Hard Silo system facilities may be available through appropriation and/or purchase from existing supplies. However, development of additional ground-water or surface-water supplies is questionable because the state-declared ground water basin is already being overdrafted and current surface-water supplies may not be expandable. The quality of surface-water sources is good, but ground water quality may be locally poor and the water may require more than conventional treatment prior to domestic use.

Holloman AFB has a complete transportation system. The main airfield has a 12,134-foot, fully instrumented runway

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with an adjacent 10,578-foot secondary runway. A spur of the Southern Pacific Railroad traverses the cantonment area. The base is located about 5 miles west of U.S. Highway 54 and a portion of the south base boundary borders U.S. Highway 70.

Because Holloman is an Air Force base, the existing logistic and personnel support systems would be relatively compatible with the Hard Silo mission.

The support services at Holloman AFB are generally good, as indicated by the size of the support community and the housing availability. The city of Alamogordo (population about 30,000) is the nearest community capable of providing a wide range of goods and services for base personnel. There are a large number of on-base housing units, but the present occupancy rate is between 88 and 90 percent.

System Practicability: Construction aggregate is available through direct development and/or purchase. Aggregate sources are well distributed throughout the region. Thirty-three percent of the potential Deployment Area contains adverse terrain.

It is likely that sufficient ground water could be developed in the potential Deployment Area through appropriation and/or purchase/ transfer of existing water

rights. However, all portions of the Deployment Area are located in state-declared ground-water basins, which could limit ground water availability.

Public Impacts: The potential for land-use conflicts in the Deployment Area is low. The potential Deployment Area contains less than 1 percent agricultural land, and no prime and unique farmland or timberland. Future land use development plans and trends are not expected to adversely affect the potential Deployment Area. Approximately 96 percent of the townships within the potential Deployment Area have 20 percent or more area under energy or mineral claim/lease. However, high value mineral and known energy resource areas do not occur in these townships.

Approximately 523 square miles of suitable area occur on military installations within 50 miles of the base. This represents 54 percent of the potential Deployment Area, which provides numerous options for siting the Hard Silo system on DoD land. The remainder of the potential Deployment Area is predominately federally administered (BLM) land, with some state and private lands.

Transportation and utility corridors affect approximately 19 percent of the potential Deployment Area, a minimal impact on the Hard Silo systems siting flexibility. A substantial effect on water availability in the support community of Alamogordo is likely to occur due to the

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increase in population from project-related workers and their dependents. The state-declared ground-water basin in which the nearby communities are located is presently in overdraft. Ground water is of poor quality locally and may require more than conventional treatment prior to domestic use. Alamogordo is only marginally able to meet its present peak demands. Expansion of the surface-water supplies that provide water to Alamogordo is unlikely.

Natural hazards in the potential Deployment Area are considered minimal. Only 4 percent of the Deployment Area is located within 100-year floodplains. Public safety concerns should be minimal due to the low density of inhabited structures within the Deployment Area.

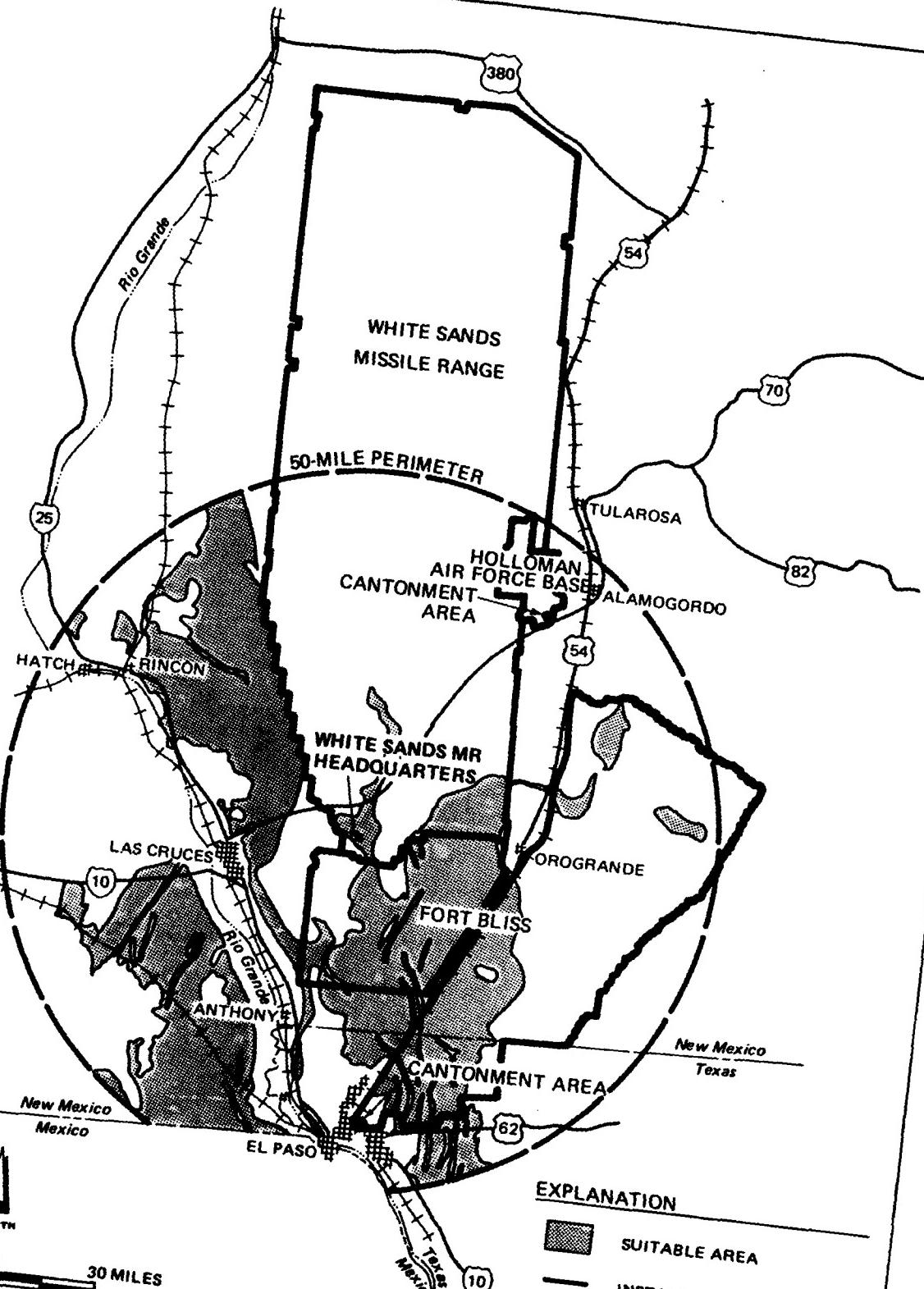
Deployment of the Hard Silo system could raise social and economic concerns in the Alamogordo area. The regional urban population is relatively low and cannot provide a wide range of goods and services. Nonagricultural employment is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is also relatively low, which means that new workers are likely to have backgrounds dissimilar to those of the resident population. The region has a limited economic diversity, as indicated by the number of export-producing industries in the area. Local governments in the region

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would not likely be able to capture tax revenues in the short term to address potential expenditure demands. There are few vacant housing units in the surrounding region to accommodate system personnel.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would not likely affect any Prevention of Significant Deterioration Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based on the cultural history of the region, the potential for discovery of these types of cultural sites is likely if a detailed field survey were performed. Wilderness Study Areas, RARE II areas, and National/State forests do not occur within the suitable parcel areas. The Jornada Experimental Farm is located southwest of Holloman AFB. The experimental farm occupies approximately 17 percent of the largest parcel, and affects 16 percent of the potential Deployment Area.

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0 15 30 MILES
SCALE

EXPLANATION

- SUITABLE AREA
- INSTALLATION BOUNDARY
- MAIN HIGHWAYS
- RAILROADS

AREA NARROWING
REPORT
VOLUME III

WHITE SANDS MISSILE RANGE HEADQUARTERS, NEW MEXICO

FIGURE
D-12-3

D-300
SENSITIVE

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D-12.3 White Sands Missile Range Headquarters, New Mexico

After considering the alternatives within the complex in relation to each other, White Sands Missile Range Headquarters (HDQR) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. The major influence in this determination was the existence of another base of equal capability that contains the more feasible deployment areas.

White Sands Missile Range HDQR is located in south-central New Mexico, 23 road miles east of Las Cruces, and about 45 road miles north of El Paso, Texas (Figure D-12-3). The Headquarters is situated in the southern portion of the range. The main portion of the range extends 95 miles to the north. Holloman Air Force Base (AFB) lies adjacent to the eastern boundary of the range, northeast of White Sands Missile Range Headquarters. Fort Bliss lies adjacent to the southern boundary of the range. White Sands Missile Range is presently used for testing missiles for various branches of the armed services.

System Effectiveness: The size and distribution of suitable area parcels within 50 miles of White Sands Missile Range HDQR provide numerous options for siting the Hard Silo system. The potential Deployment Area

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consists of eight parcels, which total 2,113 square miles of suitable area. The five smallest parcels range in size from 8 to 27 square miles; the three larger parcels vary from 88 to 1,512 square miles.

Security concerns within the potential Deployment Area would be minimal due to the overall low density of inhabited structures. The largest parcel contains concentrations of inhabited structures near its center. Existing transportation and utility corridors affect portions of the Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be enhanced by its proximity to Las Cruces (23 road miles), the nearest community that can provide a wide range of goods and services to the base. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel selected and its distance from the Main Operating Base. Distances to parcels supported by the HDQR area range from zero to 52 road miles, with an average travel distance of 44 road miles. These distances could hamper maintenance operations.

Sufficient land is available in the HDQR area for new support facilities, including Weapons Storage

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Area/Stage Storage Area facilities. No mission loss is expected at White Sands that would increase the availability of existing facilities for the Hard Silo mission. Land in the vicinity of the HDQR area is withdrawn for military use.

The utility infrastructure at White Sands Missile Range HDQR is adequate for present base operations, with some potential for expansion. Electrical power is supplied by the El Paso Electric Company, and could easily be increased. Natural gas is supplied by the El Paso Natural Gas Company and is the primary heating source. The natural gas supply is adequate for current demands, but may require expansion to accommodate the Hard Silo system requirements. The on-base waste-water treatment plant has a 1.0 million gallons-per-day design capacity. The 1980 peak average was 0.6 million gallons-per-day which leaves 40 percent available capacity. The existing landfill is adequate and could handle increased demands with minor changes to the present operation. The storm drainage system could handle considerable additional flow; flash flooding of the HDQR area, which has occurred in the past, has been accommodated by improved diking. Although ground water may be available through appropriation and/or purchase, overdrafting of the state declared ground-water basin is already occurring. Ground water quality may be

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locally poor and water may require more than conventional treatment prior to domestic use. There is no surface water available locally.

The White Sands Missile Range HDQR transportation system has limited air and rail facilities. The main airfield has a 6,125-foot runway that is not fully instrumented. The nearest 10,000-foot runways are at El Paso International Airport and Biggs Army Airfield, approximately 45 miles south of the HDQR area. The roadway system is adequate, with U.S. Highway 70 running through the range approximately 2 miles north of the Headquarters area. The nearest rail sidings are 24 and 25 miles away at Orogrande and Las Cruces, respectively. The Orogrande siding is contiguous to the White Sands Missile Range.

Because White Sands Missile Range HDQR is an Army installation, the existing logistic and personnel support systems would need to be augmented for compatibility with an Air Force mission.

White Sands Missile Range HDQR has good support services, as indicated by the size and proximity of the support community and availability of housing. Las Cruces is the nearest community (population 55,000) capable of providing a wide range of goods and services. Although some on-base housing may be

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available, additional housing will be required.

Off-base housing is available in Las Cruces.

System Practicability: Construction aggregate is available through direct development and/or purchase. Aggregate sources are distributed throughout the region. Adverse terrain occurs in 22 percent of the potential Deployment Area. This condition may impose some system siting constraints and could increase construction costs and security surveillance considerations.

It is questionable whether sufficient surface water would be available for construction activities in the potential Deployment Area. Water from the Rio Grande may be available for purchase/transfer of existing rights; however, it would have to be transported large distances to support construction at some parcels.

Although ground water may be available in the potential Deployment Area through appropriation and/or purchase, all of the New Mexico suitable area parcels are in declared ground-water basins. Litigation between El Paso and the state of New Mexico may further affect ground-water availability in other parcels.

Public Impacts: The potential for land-use conflicts in the potential Deployment Area is low. There is less than 1 percent agricultural land in the Deployment Area

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and no prime and unique farmland or timberland. Future land use development plans and trends are expected to have a low effect on the potential Deployment Area. Approximately 94 percent of the townships in the off-range deployment areas have 20 percent or greater area under mineral or energy claim/lease. However, high value mineral and known energy resource areas do not occur in these townships.

A total of 826 square miles of on-installation suitable area, or 39 percent of the potential Deployment Area, occurs within 50 miles of the HDQR area, providing numerous opportunities for on-base deployment. The remaining potential Deployment Area is located primarily on federally administered (BLM) lands, and small amounts of state and private land.

Transportation and utility corridors affect about 26 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. A substantial effect on the water availability in the support community of Las Cruces is likely to occur due to the increase in population from project workers and their dependents. The ground water basin is a state-declared basin and existing ground and surface water rights may need to be transferred to meet the increased demand of the Hard Silo system.

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Natural hazards in the potential Deployment Area are considered minimal. Three percent of the potential Deployment Area is located within identified 100-year floodplains. Public safety concerns within the potential Deployment Area should be minimal due to the small concentrations of inhabited structures in the parcels.

Although the El Paso and Las Cruces areas can provide a wide range of goods and services, the outlying region near White Sands MR may only provide relatively limited goods and services to support system construction and operation. Nonagricultural employment in the region is low, which indicates the likelihood of immigration of project-related workers. Based on regional employment in the construction and military sectors, new workers may have backgrounds similar to those of the resident population. The economic diversity of the region is good, as indicated by the number and types of export-producing industries. Local governments in the region would not likely be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in both the El Paso and Las Cruces vicinity is good, while housing availability in the region is low.

Environmental Impacts: Portions of three suitable area parcels are in non-attainment for at least one major

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air pollutant. The five remaining parcels are in attainment for all major air pollutants. Activities within the potential Deployment Area would not likely affect any Prevention of Significant Deterioration Class I areas. Several cultural resource sites within the potential Deployment Area are listed in the National Register of Historic Places. It is likely that additional sites could be discovered if a detailed field survey were performed. The potential Deployment Area contains less than 1 percent Wilderness Study Areas, no RARE II areas, and no National/State forest lands. Six percent of the potential Deployment Area is affected by the Jornada Experimental Range.

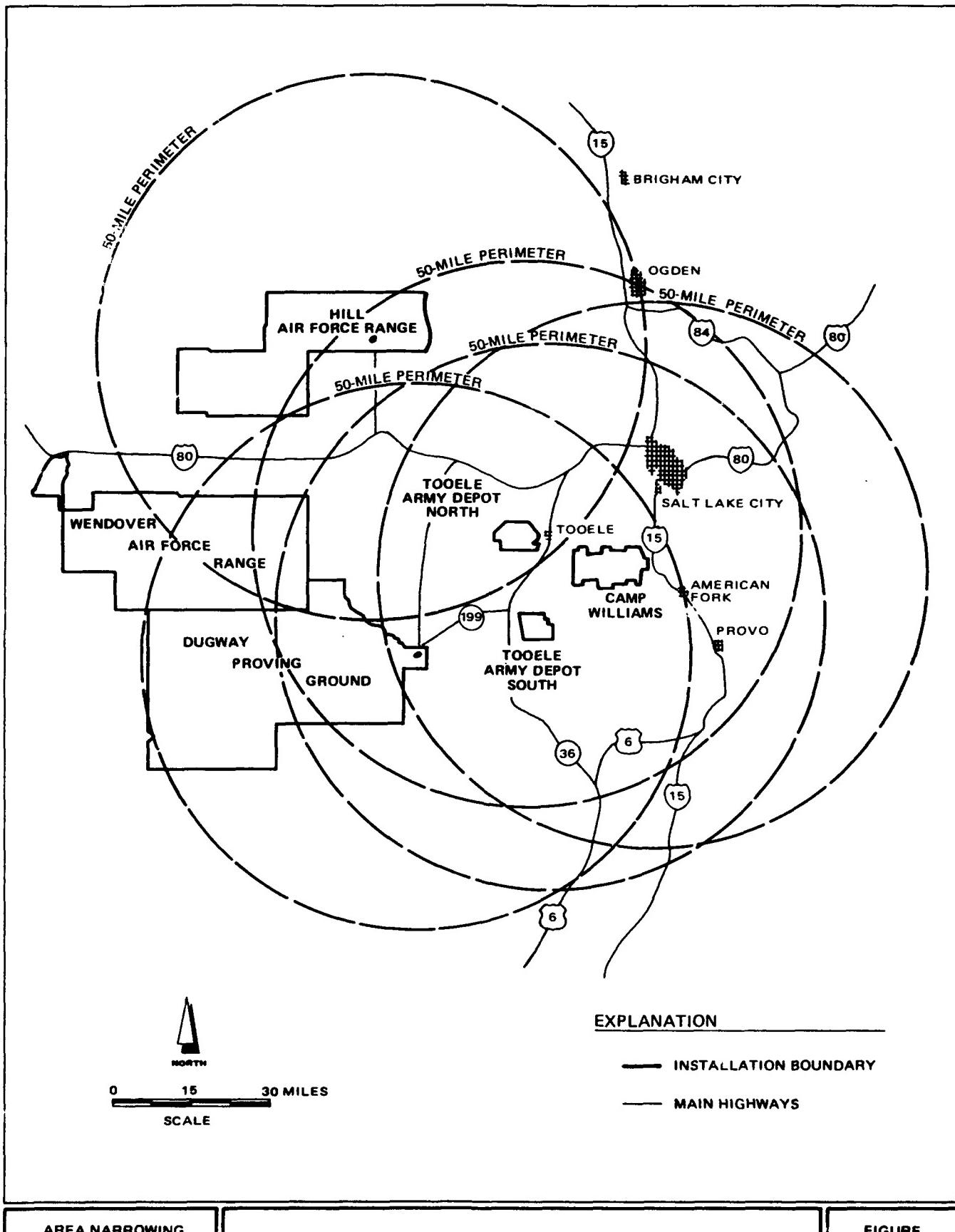
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D-310
SENSITIVE

D-13 Utah Complex

Following application of the Exclusionary Criteria, Camp Williams, Dugway Proving Ground, Hill Air Force Range, Tooele Army Depot North, and Tooele Army Depot South were grouped into a complex (Figure D-13).

Application of the Evaluative Criteria to the bases within the complex resulted in the elimination of all bases except Camp Williams. However, application of the Evaluative Criteria to the 14 complexes resulted in the elimination of Camp Williams and its potential Deployment Area. The major factors in these determinations were:

Camp Williams - size and configuration of the potential deployment areas, their distance from the potential Main Operating Base, and the amount of area dissected by transportation and utility corridors.

Dugway Proving Ground - size and configuration of the potential deployment areas, their distance from the potential Main Operating Base, the amount of area dissected by transportation and utility corridors, and the limited support services available in the immediate vicinity.

Hill Air Force Range - size and configuration of the potential deployment areas, their distance from the potential Main Operating Bases, the amount of area dissected by transportation and utility corridors, and limited support services available in the immediate vicinity.

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Tooele Army Depot North - size and configuration of the potential deployment areas, the amount of area dissected by transportation and utility corridors, and limited support services available in the immediate vicinity.

Tooele Army Depot South - size and configuration of the potential deployment areas, the amount of area dissected by transportation and utility corridors, and limited support services available in the immediate vicinity.

The following sections elaborate on the performance of each potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

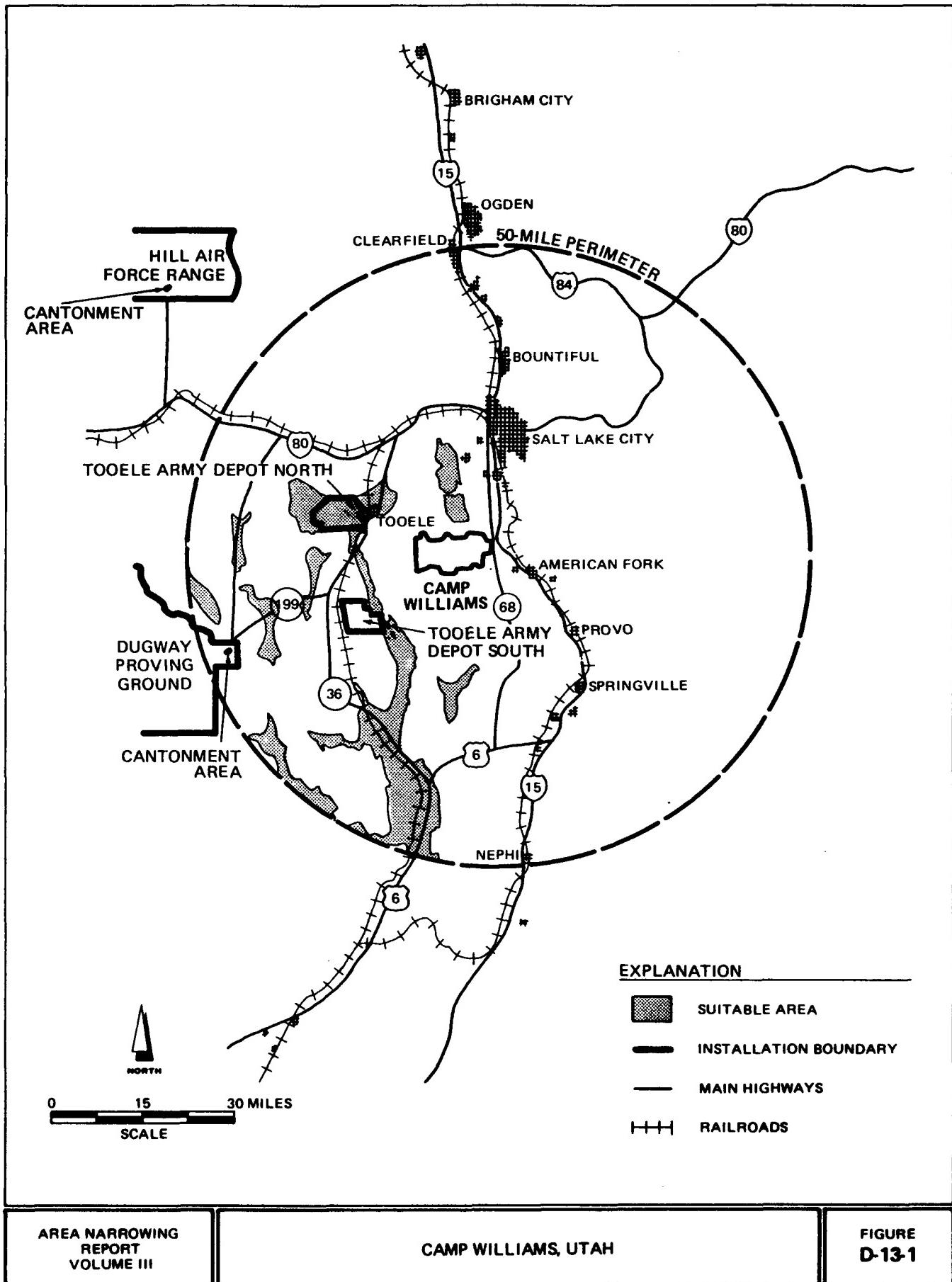
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D-13.1 Camp Williams, Utah

After evaluating the alternatives among the complexes in relation to each other, Camp Williams was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Although Camp Williams benefits from its proximity to Salt Lake City, major influences in eliminating this base were the spatial distribution of potential deployment areas, their distance from the base, and the amount of deployment area dissected by utility and transportation corridors.

Camp Williams is located in north-central Utah, approximately 20 miles south of Salt Lake City (Figure D-13-1). The base is operated by the National Guard as a training area.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Camp Williams would provide limited options for siting the Hard Silo system. The potential Deployment Area consists of eight parcels of suitable area, which total 495 square miles. Seven of these parcels range in size from 12 to 25 square miles. The eighth parcel covers 366 square miles; however, its shape limits siting options. Parcels are primarily distributed to the

south and west of the base.

Security concerns within the potential Deployment Area would be minimal due to the overall low density of inhabited structures. Transportation and utility corridors affect portions of the potential Deployment Area, causing additional concerns.

System Operability: The efficiency of Main Operating Base activities is enhanced by the short distance (20 road miles) to Salt Lake City, the nearest community capable of providing a wide range of goods and services. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel(s) selected for siting and its distance from the base. Distances to parcels from the base range from 32 to 72 road miles and average 54 road miles. These distances could hamper maintenance operations.

Available land at Camp Williams for new facilities or for Weapons Storage Area/Stage Storage Area facilities to support the Hard Silo mission is severely constrained. In addition, most of the land surrounding the base is private and public (BLM) land, which could constrain base expansion. The base does not expect a mission loss that would increase the availability of existing facilities for the Hard Silo mission.

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Presently, 78 percent of the land at Camp Williams is either DoD fee-owned or withdrawn for military use and 22 percent is state and privately owned land.

The utility infrastructure at Camp Williams is adequate for present base operations with a potential for expansion to meet future demands. Electrical power is presently supplied by the Utah Power and Light Company. Expansion of this source in order to meet future Hard Silo demand is likely. Heating at Camp Williams is provided by natural gas; supplies are projected to meet demands through the year 2000. Waste-water treatment facilities are largely off base and are adequate to meet present demand but may require expansion or on-base construction to accommodate Hard Silo operations. Solid waste is collected and disposed of off base by contractors. There is an abandoned disposal site on base and there appears to be adequate land to establish a new landfill. The base storm drainage system is primarily natural drains, with some gutters and piping. The system is adequate to handle the runoff that occurs on the base, although expansion may be required to support the Hard Silo project. It is likely that sufficient surface and ground water could be obtained through purchase/transfer of existing rights to support new facilities for the Hard Silo mission. The base presently relies on springs for

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water. The potential to obtain additional water from this source is limited. Expansion of the water supply may require the drilling of water wells or purchase of water from local surface-water supply sources. The ground-water basin, however, is closed to new appropriations. Surface and ground water sources would not need more than conventional treatment prior to domestic use.

The Camp Williams transportation system is limited. An Air National Guard Facility on base consists of a 4,100-foot, gravel, uninstrumented runway. The nearest air facility is the Salt Lake International Airport, located approximately 26 miles to the north in Salt Lake City. Dugway Proving Ground, approximately 40 miles to the west, has a 13,000-foot runway. Highway access to the base is provided by State Highway 68, which connects to Interstate Highway 15 located 5 miles east of the base. Interstate Highway 80 is about 25 miles north of the base. Railroad access is at Tooele Army Depot South, approximately 35 road miles west of the base.

Because Camp Williams is a National Guard installation, the existing logistics and personnel support services would need to be augmented to be compatible with Air Force operations.

The support services for Camp Williams are good, as indicated by the availability of housing and the proximity to a support community. On-base housing is presently inadequate for the existing mission needs, but there is room for housing expansion or infilling. Off-base housing is available in Salt Lake City and other smaller towns at reasonable prices. Salt Lake City (population about 163,000) is the nearest support community capable of providing a full range of goods and services.

System Practicability: Construction aggregate is available through purchase and/or direct development of sources distributed throughout the region. Adverse terrain conditions in the potential Deployment Area may impose some system siting constraints. Adverse terrain is present in over half of the parcels and covers 34 percent of the potential Deployment Area.

It is likely that sufficient ground water for system construction and operation is available in the potential Deployment Area through appropriation, purchase, and/or transfer. Poor quality ground water is a limiting factor for western parcels and may require more than conventional treatment prior to some construction uses. Surface water in the Deployment Area could potentially be obtained through

purchase/transfer for a few parcels. Surface water would not require treatment prior to construction use.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the Deployment Area is minimal. Agricultural land occurs in four parcels encompassing 4 percent of the potential Deployment Area; none of the Deployment Area is classified as prime and unique farmland. Potential timberlands occur in three parcels and affect 7 percent of the potential Deployment Area. Future land-use development plans and trends are expected to have some effect on the Deployment Area. Presently, 94 percent of the townships in the potential Deployment Area have 20 percent or greater area under claim/lease for energy and mineral resources, with the coverage concentrated in half of the parcels. None of the townships have known energy resource areas and only 13 percent have known or high value mineral resource areas.

There is no on-installation suitable area on Camp Williams. There are 39 square miles of on-installation suitable area, or 8 percent of the potential Deployment Area, within 50 miles of Camp Williams. However, the majority of this suitable area is presently developed. Therefore, limited options are available for Hard Silo deployment on DoD installations. The remainder of the

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potential Deployment Area occurs predominantly on federally administered (BLM) and privately owned land, with a small amount of area located on state land.

Transportation and utility corridors decrease the siting options of the Hard Silo system, affecting approximately 27 percent of the potential Deployment Area. A limited effect on water availability in the support community of Salt Lake City is likely to occur due to the increase in population from project workers and their dependents. Surface and ground water could be obtained, and water will not require more than conventional treatment prior to domestic use.

Natural hazards in the potential Deployment Area are considered minimal. Small portions of several parcels are located within identified 100-year floodplains, and total 2 percent of the potential Deployment Area. Due to the very small areas of isolated and/or low density inhabited structures, public safety concerns would be minimal.

Although Salt Lake City can provide a wide range of goods and services, the outlying region around Camp Williams has a moderately sized urban population, implying a moderate level of goods and services available to support system construction and operation. Nonagricultural employment is low which increases the

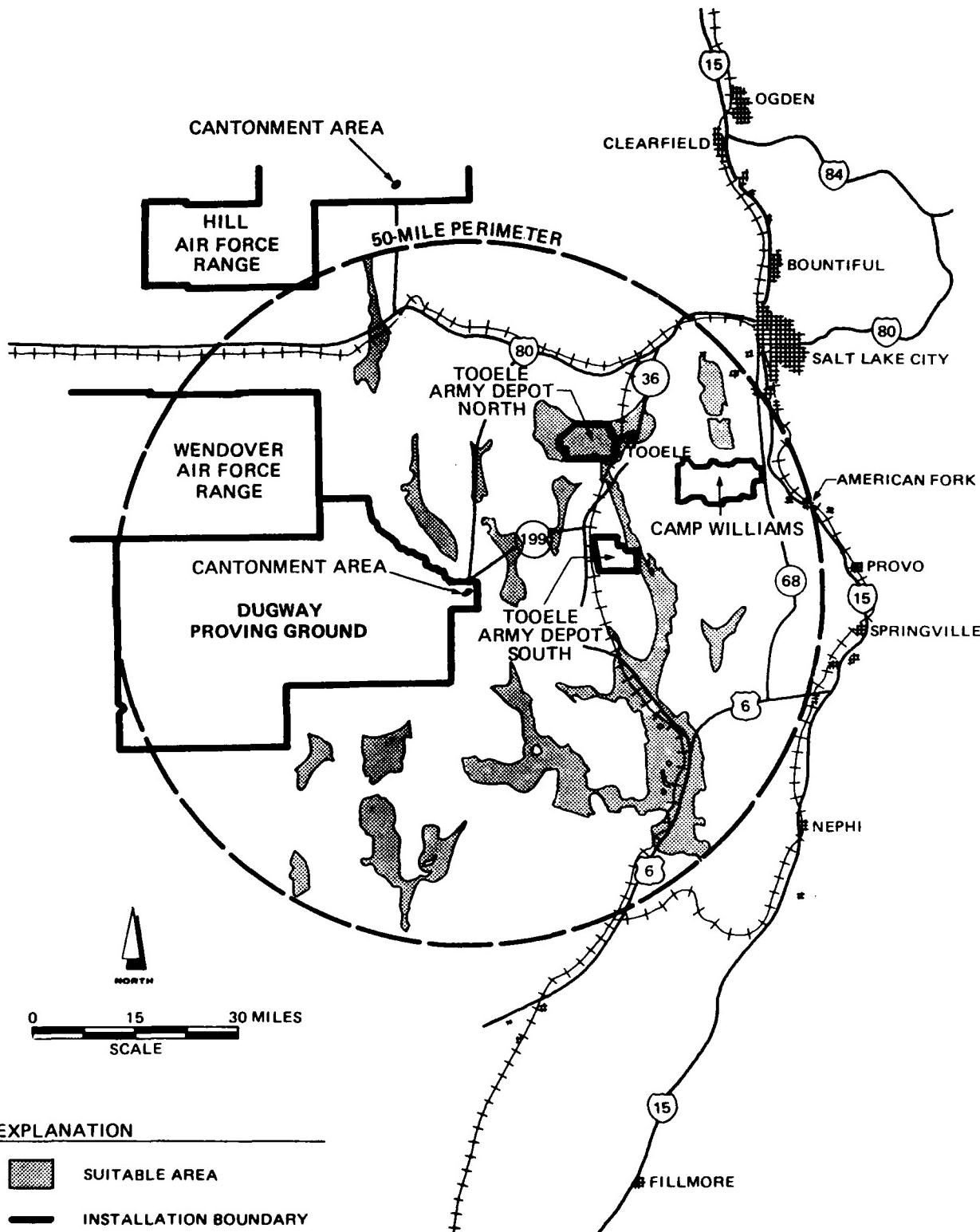
likelihood of immigration of project-related workers. The number of persons working in the construction and military sectors is moderate, which means that immigrant project workers may have backgrounds dissimilar to those of the existing population. The region has more export-producing industries than other areas examined, which indicates good economic diversity. Local governments in the region have been able to capture a reasonable amount of tax revenues in the short term and should continue to address potential expenditure demands. Although the region shows moderate socioeconomic capabilities when compared to other regions, the proximity of Salt Lake City and other communities along Interstate Highway 15 would indicate a much stronger ability to absorb project-related changes. Housing in the region is also reasonably available.

Environmental Impacts: Most of the potential Deployment Area is in attainment for all major air pollutants, however three parcels are in nonattainment for at least one pollutant. Activities within the Deployment Area would be unlikely to affect any Prevention of Significant Deterioration Class I areas. No cultural resource sites listed in the National Register of Historic Places are located within the potential Deployment Area. Based on the cultural

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history of the region, these types of cultural resource sites may be discovered if a detailed field survey were performed. None of the Deployment Area contains Wilderness Study Areas, RARE II areas, or experimental ranges/farms. National/State forest land affects 4 percent of the potential Deployment Area.

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EXPLANATION

- [Shaded Box] SUITABLE AREA
- [Solid Line] INSTALLATION BOUNDARY
- [Dashed Line] MAIN HIGHWAYS
- [Dash-dot Line] RAILROADS

AREA NARROWING
REPORT
VOLUME III

DUGWAY PROVING GROUND, UTAH

FIGURE
D-13-2

D-13.2 Dugway Proving Grounds, Utah

After evaluating the alternatives within the complex in relation to each other, Dugway Proving Grounds (PG) was eliminated from further study. The potential proposed Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the spatial distribution of the potential deployment areas, their distance from the base, and the amount of deployment area dissected by utility and transportation corridors. Another contributing factor was the very limited support services available in the immediate vicinity.

Dugway PG is located in northwestern Utah, approximately 40 miles southwest of the city of Tooele and 87 miles southwest of Salt Lake City (Figure D-13-2). The installation is operated by the Test and Evaluation Command of the Army and is a major test range facility for chemical warfare and biological defense systems.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Dugway PG would provide limited options for siting the Hard Silo system. The potential Deployment Area consists of 13 parcels of suitable area, which total 801 square miles. Twelve of the parcels range in size from 12 to

86 square miles. The thirteenth parcel contains 475 square miles; however, its shape limits siting options.

Security concerns within the potential Deployment Area would be minimal because of the overall lack of inhabited structures. Transportation and utility corridors affect portions of the potential Deployment Area, causing additional concern.

System Operability: The efficiency of Main Operating Base activities is degraded by the excessive distance to Salt Lake City (87 road miles), the nearest community that could provide a wide range of goods and services. The city of Tooele is approximately 40 miles from the base; however, it has a small population and limited support services. The accessibility to maintenance facilities at the Main Operating Base from the potential Deployment Area is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances to suitable area parcels from the base range from 14 to 63 road miles and average 41 road miles. These distances could hamper maintenance operations.

A sufficient amount of land is available on base for new support facilities as well as Weapons Storage Area/Stage Storage Area facilities for the Hard Silo mission. The base does not expect a mission loss that

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would increase the availability of existing facilities for the Hard Silo mission. Presently, over 99 percent of the land at Dugway PG is either land withdrawn for military use or DoD fee-owned.

With the exception of the power system, the utility infrastructure at Dugway PG is adequate for present base operations. Some utilities have the capacity for expansion to accommodate the Hard Silo mission.

Electrical power is presently provided by Utah Power and Light. The on-base distribution system is being modernized; however, capacity is inadequate and expansion would be difficult. Natural gas is currently not supplied to the base; heating is presently provided by fuel oil. Expansion of this system to support the Hard Silo mission is not likely to be feasible.

Capacity of the existing on-base waste-water treatment facilities is much greater than present demand. The planned construction of additional lagoons will make the facilities more than adequate to meet future demands. Solid waste is disposed of on base in a landfill that has an expected remaining life of 15 years, with potential for expansion. The base storm drainage system is a network of open ditches that are inadequate to handle runoff from heavy rains. Flash flooding has occurred, causing some damage to the roadways. It is likely that sufficient ground water

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would be available through appropriation to meet the increased on-base needs of the Hard Silo mission; however, significant expansion of the existing water-supply facilities would be required. Ground water is locally of poor quality and may require more than conventional treatment prior to domestic use. There is no surface-water supply in the area.

The Dugway PG transportation system is limited by the long distance to a primary highway and the lack of rail service. The base has an instrumented runway that is 13,125 feet long. Access to Dugway PG is provided by a county road that leads to Interstate Highway 80, approximately 40 miles to the north. Although there presently is no rail service to the base, construction of a spur is planned for 1990.

Because Dugway PG is an Army installation, the existing logistic and personnel support systems would need to be augmented to be compatible with Air Force operations.

The support services for Dugway PG are limited, as indicated by the availability of housing and the large distance to a support community. On-base housing has a 98 to 100 percent occupancy rate. There are no incorporated communities within 25 miles of the base. The nearest off-base housing is located in the

community of Tooele, 40 miles northeast of Dugway PG.

System Practicability: Construction aggregate is available through purchase and/or direct development of sources that are distributed throughout the region. Adverse terrain conditions have some effect on the proposed Deployment Area. Adverse terrain, which could increase construction and security surveillance costs, is present in approximately 18 percent of the proposed Deployment Area.

It is likely that ground water would be available in the potential Deployment Area for system construction and operation through appropriation and/or purchase/transfer of existing water rights. Ground water is of poor quality in local areas and may require more than conventional treatment prior to use. Surface water may be available in some parcels through the purchase/transfer of existing water rights and would not require treatment prior to use in construction.

Public Impacts: The potential for land-use conflicts from deployment of the Hard Silo system within the potential Dugway PG Deployment Area is low. Less than 1 percent of the area is agricultural land, and none of the potential Deployment Area is classified as prime and unique farmland. Potential timberland occurs in 4 percent of the Deployment Area. Future land-use

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development plans are expected to have a small effect on the potential Deployment Area. About 74 percent of the townships in the potential Deployment Area have greater than 20 percent claim/lease coverage for energy and mineral resources. Although none of the townships have known energy resource areas, four parcels do contain high-value mineral resource areas, affecting 8 percent of the townships.

There is no suitable area on or adjacent to the Dugway PG. Only 39 square miles of potential Deployment Area occur on DoD installations (Tooele AD North and Tooele AD South) within 50 miles of Dugway PG. A majority of the on-installation area is presently developed.

Approximately 5 percent of the Deployment Area is located on DoD land. The remaining potential Deployment Area is located on predominantly federally administered (BLM) land, with some privately owned land and a limited amount of state owned land.

Transportation and utility corridors affect 18 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. A limited effect on water availability in the support community of Salt Lake City is likely to occur due to the increase in population from project workers and their dependents. It is likely that surface and ground

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water could be obtained to support increased needs. The water would not require more than conventional treatment prior to domestic use.

Natural hazards in the potential Deployment Area are considered minimal. Portions of four parcels lie within identified 100-year floodplains, but affect only 2 percent of the potential Deployment Area. Public safety concerns should be minimal due to the general lack of inhabited structures within the potential Deployment Area.

The region of influence surrounding Dugway PG has a moderately low population, indicating a moderate amount of goods and services. Nonagricultural employment is low, which increases the likelihood of immigration of project-related workers. Construction and military employment is low when compared with other areas, which means that new project-related workers will likely have backgrounds dissimilar to those of the resident population. The economic diversity of the region is relatively high, as indicated by the number of export-producing industries in the region. Local governments in the region will probably not be able to capture tax revenues in the short term in order to address potential expenditure demands. Housing availability in the region is limited.

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Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants, with the exception of one suitable area parcel located near Salt Lake City, which is in nonattainment for at least one pollutant. Activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within the proposed Deployment Area. Additional cultural resource sites may be discovered if a detailed field survey were performed in the proposed Deployment Area. No Wilderness Study Areas, RARE II areas, or experimental ranges/farms are present within the proposed Deployment Area. National/State forest land affects 3 percent of the potential Deployment Area.

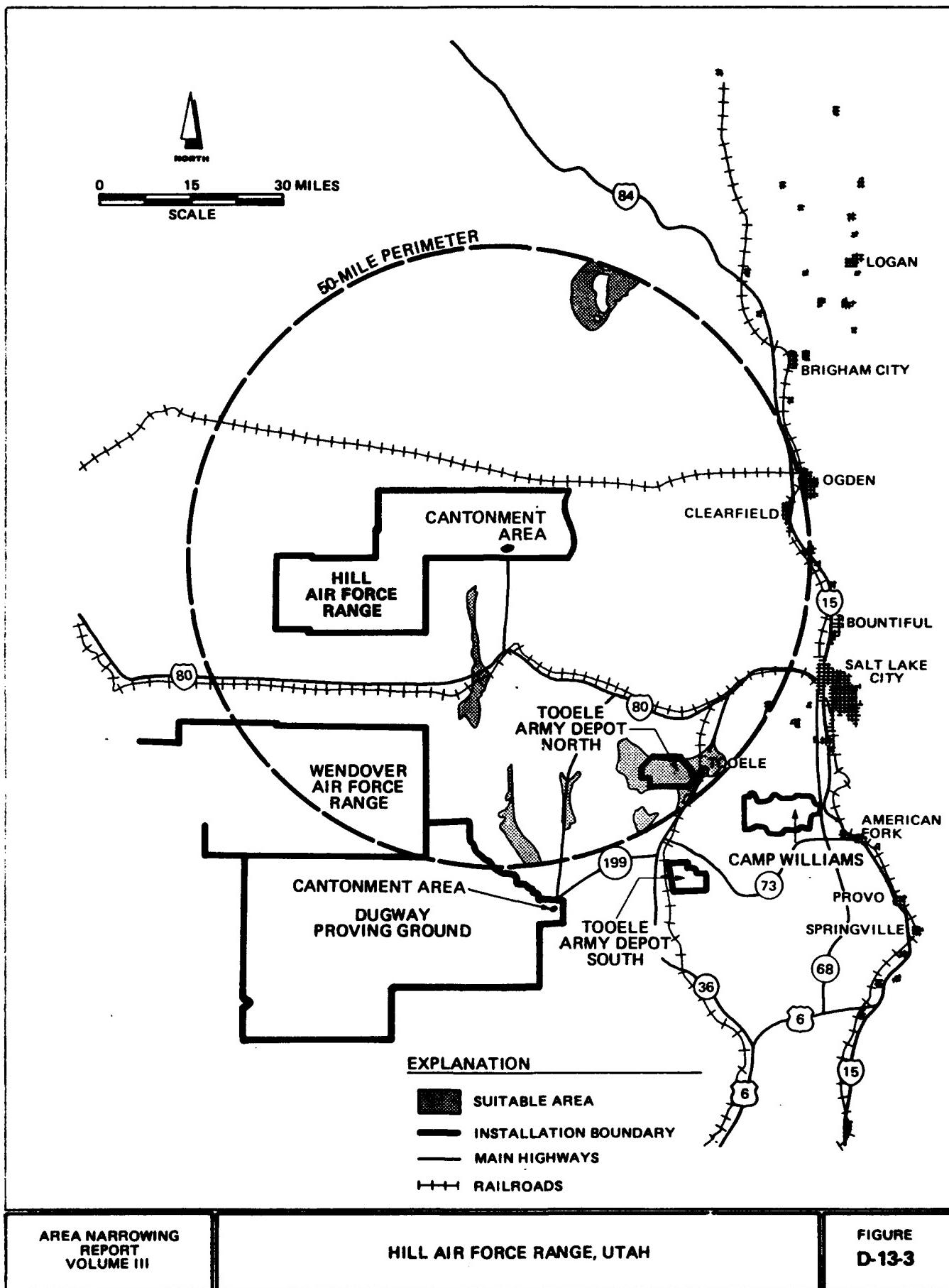
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D-13.3 Hill Air Force Range, Utah

After evaluating the alternatives within the complex in relation to each other, Hill Air Force Range (AFR) was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the size of the potential deployment areas, their distance from the base, the amount of deployment area dissected by utility and transportation corridors, and the lack of support services in the immediate vicinity.

Hill AFR, which comprises the northern portion of the Utah Test and Training Range (UTTR), is located approximately 80 miles west of Salt Lake City (Figure D-13-3). The UTTR, located in northwestern Utah in the Great Salt Lake Desert, is used for test evaluations of ordnance and munitions.

System Effectiveness: Suitable area parcels within 50 radial miles of Hill AFR are of sufficient size and distribution to provide some options in siting the Hard Silo system. The potential Deployment Area consists of six parcels of suitable area, which comprise a total of 238 square miles. The parcels range in size from 9 to 90 square miles.

Only one parcel contains a small area that has a low density of inhabited structures; this would produce only

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minimal security concerns within the potential Deployment Area. Existing transportation and utility corridors affect portions of the proposed Deployment Area, causing additional concerns.

System Operability: The efficiency of the Main Operating Base activities would be degraded by the excessive distance to Salt Lake City, which is approximately 80 miles east of the base, the nearest community capable of providing a wide range of goods and services. The accessibility of the potential Deployment Area to maintenance facilities is dependent upon the final parcel(s) selected for siting and its distance from the Main Operating Base. Distances from the base to parcels range from 25 to 165 road miles and average 72 road miles. These distances could hamper maintenance operations.

The base does not expect a mission loss that would increase the availability of existing facilities for the Hard Silo mission. There is ample land for construction of new support facilities and Weapons Storage Area/Stage Storage Area facilities for the Hard Silo mission.

The utility infrastructure at Hill AFR is adequate for present base operations, and there is potential for expansion of most utilities. Electrical power is presently supplied by Utah Power and Light from Price, Utah; potential for expansion of the electrical system

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appears to be high. Heating is provided by diesel oil and propane. Expansion of the system to support the Hard Silo mission is probably not feasible. The waste-water system appears to have adequate capacity for present use, but may require expansion of the facilities to accommodate increased demands. Solid waste is disposed of in an on-base landfill that has a high potential for landfill expansion. The storm drainage system is not adequate for present needs, because erosion of ditches after thundershowers creates maintenance problems. Expansion of the system would be necessary to support the Hard Silo system. The availability of ground water to support the base demands of the Hard Silo mission is questionable due to very poor water quality. Expansion of the on-base reverse osmosis treatment facilities would be necessary. No surface-water supply sources occur in the base area.

The base is served by a very limited transportation system. No airfields are located on base. Airfields in the vicinity are located at Hill Air Force Base (60 miles east), Salt Lake City International Airport (54 miles southeast), and Dugway Proving Grounds (65 miles south). Highway access to the base from Interstate Highway 80 is via 18 miles of county roads. The nearest railroad services are a Union Pacific siding, 25 miles south of the base, and a Southern Pacific siding, 15 miles north of the base.

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Because Hill AFR is an Air Force installation, the existing logistic and personnel support systems would be relatively compatible with Hard Silo operations.

The support services for Hill AFR are very limited, as indicated by the availability of housing and the proximity to a community. The only on-base housing is 21 trailer units, which are considered to be in substandard condition. However, there is available land for housing expansion. There is no incorporated community within 25 miles of the base. The nearest off-base housing is located in the town of Grantsville, which is approximately 55 road miles southeast of the base. In Grantsville, rental and purchase costs are relatively low, but availability is limited.

System Practicability: Construction aggregate is available through purchase and/or direct development of sources distributed throughout the region. Adverse terrain conditions have a minor effect on the potential Deployment Area. Adverse terrain, which could increase construction and security surveillance costs, is present in only 5 percent of the Deployment Area.

It is likely that ground water for system construction and operation would be available in the potential Deployment Area through appropriation, purchase, and/or transfer of existing water rights. Ground water may be of poor

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quality in some areas and may require more than conventional treatment prior to domestic use. Surface water may be available in one parcel through purchase/transfer of existing water rights and would likely not require treatment for construction use.

Public Impacts: There is limited potential for land-use conflicts in the Deployment Area. The potential Deployment Area contains no timberland, 14 percent agricultural land, and no land classified as prime and unique farmland. Future land-use development trends are expected to have a low effect on the potential Deployment Area. Approximately 57 percent of townships in the potential Deployment Area have 20 percent or more area under claim/lease for energy and mineral resources. However, none of these townships contain known energy resource areas and only 3 percent contain known high value mineral resource areas.

There is no on-installation suitable area at Hill AFR; however, there are 35 square miles of on-installation suitable area, or 15 percent of the Deployment Area, at Tooele AD North, which provides limited options for Hard Silo deployment on DoD installations within 50 miles of Hill AFR. Most of this on-installation suitable area has been developed. The remainder of the Deployment Areas occurs predominantly on private and federally administered (BLM) land.

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Transportation and utility corridors affect 21 percent of the potential Deployment Area, decreasing the siting options available to the Hard Silo system. A limited effect on water availability in the support community of Salt Lake City is expected to occur due to the increase in population from project workers and their dependents. It is likely that surface and ground water of good quality could be obtained for construction.

Natural hazards in the potential Deployment Area are minimal. Less than 1 percent of the Deployment Area is located within identified 100-year floodplains. The lack of inhabited structures within most of the Deployment Area will minimize public safety concerns.

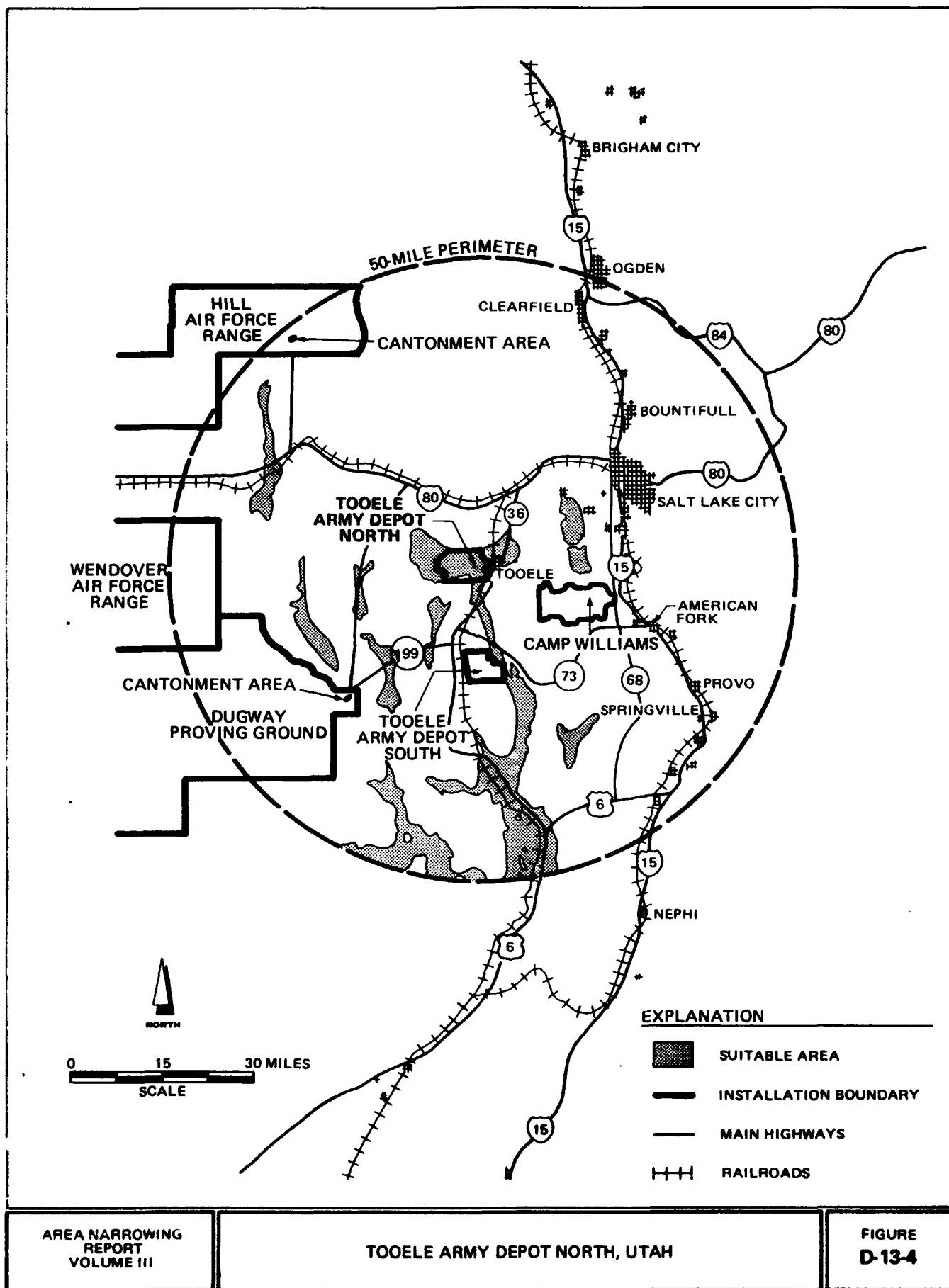
The urban population in the region of influence surrounding Hill AFR is relatively small. Most of the population and attendant support services are concentrated about 80 miles to the east, in Salt Lake City. It is unlikely that Salt Lake City would receive a large proportion of the expected influx of personnel and dependents, due to the long travel distance to Hill AFR. Nonagricultural employment in the region is also very low, which increases the likelihood of increased immigration of project-related workers. In addition, relatively few persons are employed in the construction and military sectors, so that new workers are likely to have

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backgrounds dissimilar to those of the resident population. The economic diversity of the region is low as indicated by the small number of export-producing industries in the region. Local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. The availability of housing in the region is very low.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would be unlikely to affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within the Deployment Area. Additional cultural resource sites could be discovered if detailed field surveys were performed in the potential Deployment Area. The Deployment Area does not contain any Wilderness Study Areas, RARE II areas, or experimental ranges/farms. The potential Deployment Area contains less than 1 percent National/State forest land.

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D-13.4 Tooele Army Depot North, Utah

After evaluating the alternatives within the complex in relation to each other, Tooele Army Depot (AD) North was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the spatial distribution of potential deployment areas and the amount of deployment area dissected by transportation and utility corridors.

Tooele AD North is located in northwestern Utah, approximately 2 miles west of the city of Tooele and 34 miles southwest of Salt Lake City (Figure D-13-4). Tooele AD is a supply depot for the maintenance and disposal of general supplies and ammunition. As a part of the Army Depot System Command, Tooele AD has operational control over Pueblo, Umatilla, Fort Wingate, and Navajo Depot activities.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Tooele AD North would provide limited options for siting the Hard Silo system. The potential Deployment Area consists of nine parcels of suitable area, which total 537 square miles. Eight of these parcels are comparatively small and range from 12 to 36 square

miles. The ninth parcel covers 360 square miles; however, its shape limits siting options.

Security concerns within the potential Deployment Area would be minimal due to the overall low density of inhabited structures. Transportation and utility corridors affect portions of the potential Deployment Area, causing some security concerns.

System Operability: The efficiency of Main Operating Base activities would be degraded by the distance to Salt Lake City (34 road miles), the nearest community that could supply a wide range of goods and services. The city of Tooele is adjacent to the base; however, it can provide only limited goods and services. The accessibility of the potential Deployment Area to maintenance facilities is dependent upon the final parcel(s) selected for siting and its distance from the base. Distances to parcel areas from Tooele AD North range from 19 to 47 road miles and average 36 road miles. These distances could hamper maintenance operations.

Sufficient land is available on base for new support facilities for the Hard Silo mission including Weapons Storage Area/Stage Storage Area facilities. The base does not expect a mission loss that would increase the availability of existing facilities for the Hard Silo

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mission. On-base land is 85 percent DoD fee-owned and 15 percent withdrawn for military use.

The utility infrastructure at Tooele AD North appears adequate for present use, with some potential for increased capacity. Electrical power is supplied by Utah Power and Light. Additional supply is available; however, the potential for expansion of the distribution system is uncertain. Fuel oil is the primary energy source for heating facilities on the installation. Expansion of this system to support the Hard Silo mission may not be feasible. The waste-water treatment system is less than adequate for present needs, requiring a major upgrade to accommodate future demands. A sanitary landfill that can be easily expanded is located on base. The storm drainage system appears adequate for present needs, but may require expansion. It is likely that sufficient ground water is available for the increased base demand of the Hard Silo mission through purchase/transfer. The local ground-water basin is closed to new appropriations, precluding any direct development. Water quality is not a limiting factor. Surface water is not readily available. Significant expansion of the on-base water facilities would be required to accommodate the Hard Silo mission.

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The transportation network at Tooele AD North is limited by the lack of air facilities. The only on-base air facility is a helicopter pad. The closest large runways are at Salt Lake City International Airport, which is over 30 miles north of the base, and a 13,000-foot runway at Dugway Proving Ground, which is 35 miles west of the base. Primary highway access to the base is provided by State Highway 36, which is adjacent to the east boundary of the base, and Interstate Highway 80, which is approximately 12 miles north of the main entrance to the base. The rail system on the base includes 62 miles of track, which serve the supply, ammunition, and maintenance areas.

Because Tooele AD North is an Army facility, the existing logistics and personnel support systems would need to be augmented to be compatible with Air Force operations.

The support services for Tooele AD North are good, as indicated by the availability of housing and proximity to a large community. The availability of housing in the vicinity of Tooele AD North is moderate. Although barracks are available on-base, family housing is very limited. Off-base housing is available in the nearby city of Tooele, and a wide variety of housing is available 34 road miles northeast in Salt Lake City.

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In addition, the city of Sandy is within 25 radial miles of the base and could provide numerous goods and services.

System Practicability: Construction aggregate sources are distributed within the region and are available through direct development and/or purchase. Adverse terrain occurs in 28 percent of the proposed Deployment Area. This condition may impose some system siting constraints and could increase construction and security surveillance costs. It is likely that ground water for system construction and operations can be obtained through appropriation or purchase/transfer of existing water rights in most suitable area parcels. Ground water in many basins is of poor quality and may require more than conventional treatment prior to some construction use. Surface water is potentially available through purchase/transfer of water rights for some parcels and would not need treatment for construction use.

Public Impacts: The potential for land-use conflicts in the potential Deployment Area is minimal. This area contains 3 percent agricultural land, 6 percent potential timberlands, and no prime and unique farmland. Future land-use development plans are expected to adversely affect half of the parcels.

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Eighty-three percent of the townships in the potential Deployment Area have 20 percent or more area under claim/lease for energy and mineral resources. However, none of these townships contain known energy resource areas and only 10 percent of the townships contain known mineral resource areas.

Tooele AD North contains 35 square miles of suitable area. An additional 4 square miles of suitable area occurs on Tooele AD South. The total of 39 square miles of on-installation suitable area, or seven percent of the potential Deployment Area, provides a limited potential for Hard Silo deployment on DoD installations within 50 miles of Tooele AD North. In addition, the majority of this on-installation suitable area is presently developed. The remainder of the Deployment Area is federally administered (BLM) and private land.

Transportation and utility corridors affect 26 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. A minimal effect on water availability in the support community of Salt Lake City is expected to occur due to the increase in population from project workers and their dependents. It is likely that additional surface water and ground water supplies could be developed.

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Water quality is not a limiting factor.

Natural hazards in the potential Deployment Area are considered to be minimal. Two percent of the Deployment Area occurs within identified 100-year floodplains. The general lack of inhabited structures will minimize public safety concerns within the Deployment Area.

Although Salt Lake City can provide a wide range of goods and services, the outlying region near Tooele AD North has a moderately sized urban population, implying a moderate level of goods and services available to support system construction and operation.

Nonagricultural employment in the region is moderate, which indicates that immigration of project-related workers can be expected. Regional employment in the construction and military sectors is also moderate, which suggests that many new workers may have backgrounds similar to those of the resident population. The economic diversity of the region is relatively high as indicated by the number of export-producing industries in the region. Local governments in the region should be able to capture tax revenues in the short run to address potential expenditure demands. Housing availability in the support community and in the region is low. Some of

the comparative regional disadvantages will be offset to some extent by the proximity of Salt Lake City and its apparent ability to provide a wide range of necessary goods and services.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants, with the exception of one parcel near Salt Lake City. This parcel is in nonattainment for at least one pollutant. Activities within the suitable area parcels would likely not affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites located within one parcel are listed in the National Register of Historic Places. Additional cultural resource sites may be discovered if a detailed field survey were performed in the Deployment Area. No Wilderness Study Areas, RARE II areas, or experimental ranges/farms are located within the potential Deployment Area. This area does contain 4 percent National/State forest land.

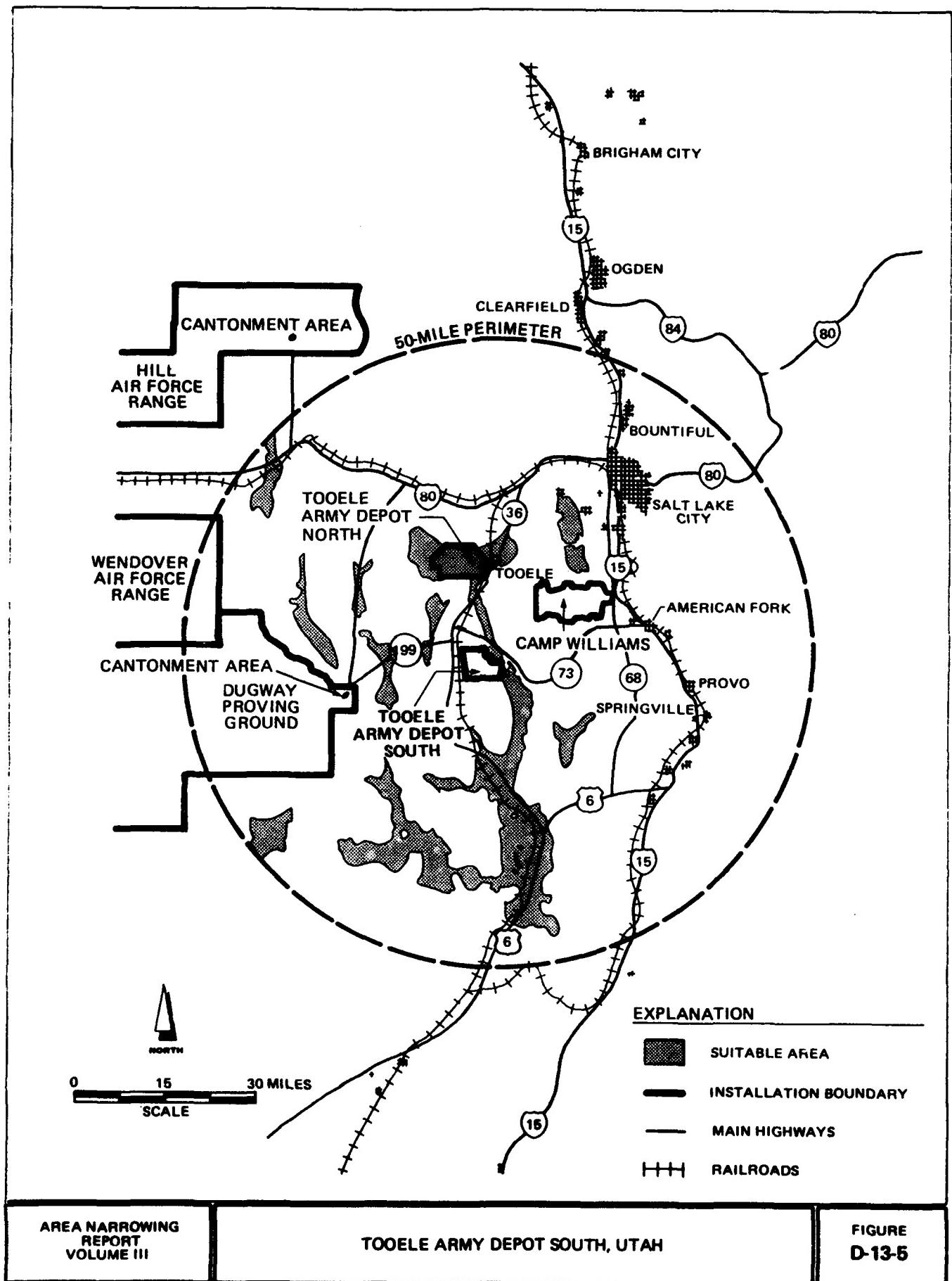
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D-13.5 Tooele Army Depot South, Utah

After evaluating the alternatives within the complex in relation to each other, Tooele Army Depot (AD) South was eliminated from further study. The potential Main Operating Base/Deployment Area has less than favorable characteristics for Hard Silo deployment. Major influences in this determination were the spatial distribution of potential deployment areas, the amount of deployment area dissected by transportation and utility corridors, and the limited support services available in the immediate vicinity.

Tooele AD South is located in northwestern Utah, approximately 17 miles south of Tooele and 49 miles southwest of Salt Lake City (Figure D-13-5). Tooele AD is a supply depot for the maintenance and disposal of general supplies and ammunition. As a part of the Army Depot System Command, Tooele AD has operational control over Pueblo, Umatilla, Fort Wingate, and Navajo Depot activities.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of Tooele AD South would provide limited options for siting the Hard Silo system. The potential Deployment Area consists of ten parcels of suitable area, which total 679 square miles. Nine of these parcels are

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comparatively small and range from 12 to 33 square miles. The tenth parcel covers 479 square miles; however, its shape limits siting options.

Security concerns within the potential Deployment Area would be minimal due to the overall low density of inhabited structures. Transportation and utility corridors affect portions of the potential Deployment Area, causing additional security concerns.

System Operability: The efficiency of Main Operating Base activities would be degraded by the distance to Salt Lake City (49 road miles), the nearest community that could supply a wide range of goods and services. Tooele, the nearest community, is about 17 road miles from the base but could supply only limited goods and services. The accessibility of the potential Deployment Area to maintenance facilities is dependent upon the final parcel(s) selected for siting and its distance from the base. Distances to suitable area parcels from the base range from 14 to 66 road miles and average 38 road miles. These distances could hamper maintenance operations.

Sufficient land is available on base for new support facilities for the Hard Silo mission, including Weapons Storage Area/Stage Storage Area facilities. The base does not expect a mission loss that would increase the

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availability of existing facilities for the Hard Silo mission. On-base land is 22 percent DoD fee-owned and 78 percent withdrawn for military use.

The utility infrastructure at Tooele South is adequate for present use, with some potential for increased capacity. Electrical power is supplied by Utah Power and Light. Additional supply is available; however, the potential for expansion of the distribution system is uncertain. Fuel oil is the primary energy source for heating. Expansion of this system to support the Hard Silo mission may not be feasible. The waste-water system is adequate for present needs; however, expansion of the system may be required to accommodate future demands. One landfill of unknown capacity is used on the base for solid waste disposal. The storm drainage system, which consists of surface ditches and culverts, appears adequate for present needs, but expansion may be required. It is likely that ground water is available for the increased base demands of the Hard Silo mission through appropriation or purchase/transfer. Water quality is not a limiting factor. Surface water is not readily available as a source. Significant expansion of the on-base facilities would be required to accommodate the Hard Silo mission.

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The transportation network of Tooele AD South is limited by a lack of air facilities. The closest large runways are at Salt Lake City International Airport, which is about 50 miles north of the base, and a 13,000-foot runway at Dugway Proving Grounds, which is about 35 miles west of the base. Highway access to the base is provided by State Highway 73, which is adjacent to the north boundary of the base, and Highway 36, which is adjacent to the western boundary of the base. Rail service is provided by a spur connected to a Union Pacific line, which is adjacent to the western base boundary.

Because Tooele AD South is an Army facility, the existing logistics and personnel support systems would need to be augmented to be compatible with Air Force operations.

The support services for Tooele AD South are limited, as indicated by the availability of housing and the proximity of a community. No housing is located on base. The largest community within 25 miles of the base is Tooele (population 14,000), which can provide limited amounts of goods and services. Some off-base housing is available in Tooele, and a wide variety of housing is available approximately 50 miles northeast in Salt Lake City.

System Practicability: Construction aggregate is available through purchase and/or direct development of sources distributed within the region. Fifteen percent of the potential Deployment Area contains adverse terrain. This condition may impose some system siting constraints and could increase construction and security surveillance costs. It is likely that ground water for system construction and operations could be obtained in the potential Deployment Area through appropriation or purchase/transfer of existing water rights. Ground water in many basins is of poor quality and may require more than conventional treatment prior to use. Surface water is potentially available through purchase/transfer of existing water rights for some parcels and would not require more than conventional treatment prior to some construction uses.

Public Impacts: The potential for land-use conflicts in the potential Deployment Area is minimal. This area contains 3 percent agricultural land and no prime and unique farmland. Approximately 5 percent of the potential Deployment Area also contains potential timberlands. Future land-use development plans are expected to adversely affect some of the potential Deployment Area. Seventy-eight percent of the townships in the Deployment Area have 20 percent or more area under claim/lease for energy and mineral

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resources. However, no known energy resource areas are present and known mineral resource areas occur in only 8 percent of these townships.

Tooele AD South contains 4 square miles of suitable area; an additional 35 square miles of suitable area occur on Tooele AD North. This total of 39 square miles of on-installation suitable area, or six percent of the potential Deployment Area, provides only limited options for Hard Silo deployment on DoD installations. In addition, the majority of this suitable area is presently developed. The remainder of the Deployment Area occurs predominantly on federally administered (BLM) land, with some area on private land.

Transportation and utility corridors affect 22 percent of the potential Deployment Area, and decrease the siting options available to the Hard Silo system. A minimal effect on water availability in the support community of Salt Lake City is expected to occur due to the increase in population from project workers and their dependents. It is likely that additional surface water and ground-water supplies could be developed. Water quality is not a limiting factor.

Natural hazards in the potential Deployment Area are considered to be minimal. Two percent of the Deployment Area occurs within identified 100-year

floodplains. The general lack of inhabited structures will minimize public safety concerns within the potential Deployment Area.

Although Salt Lake City can provide a reasonably wide range of goods and services, it is distant from Tooele AD South. The outlying region near Tooele AD South has a moderately sized urban population, implying that a moderate level of goods and services is available to support system construction and operation.

Nonagricultural employment in the region is moderate, which indicates that there may be inmigration of project-related workers. Regional employment in the construction and military sectors is also moderate, which suggests that many workers may have backgrounds similar to those of the resident population. The economic diversity of the region, based on the number of export-producing industries in the region, is high. Local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the support community and in the region is limited. Some of the comparative regional disadvantages could be offset to some extent by the proximity of Salt Lake City and its apparent ability to provide a wide range of necessary goods and services.

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Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants, with the exception of one suitable area parcel near Salt Lake City. This parcel is in non-attainment for at least one pollutant. Activities within the Deployment Area would likely not affect any Prevention of Significant Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are found within the Deployment Area. Additional cultural resource sites could be discovered if a detailed field survey were performed in the Deployment Area. No Wilderness Study Areas, RARE II areas, or experimental ranges/farms are located within the potential Deployment Area. This area does contain 3 percent National/State forest land.

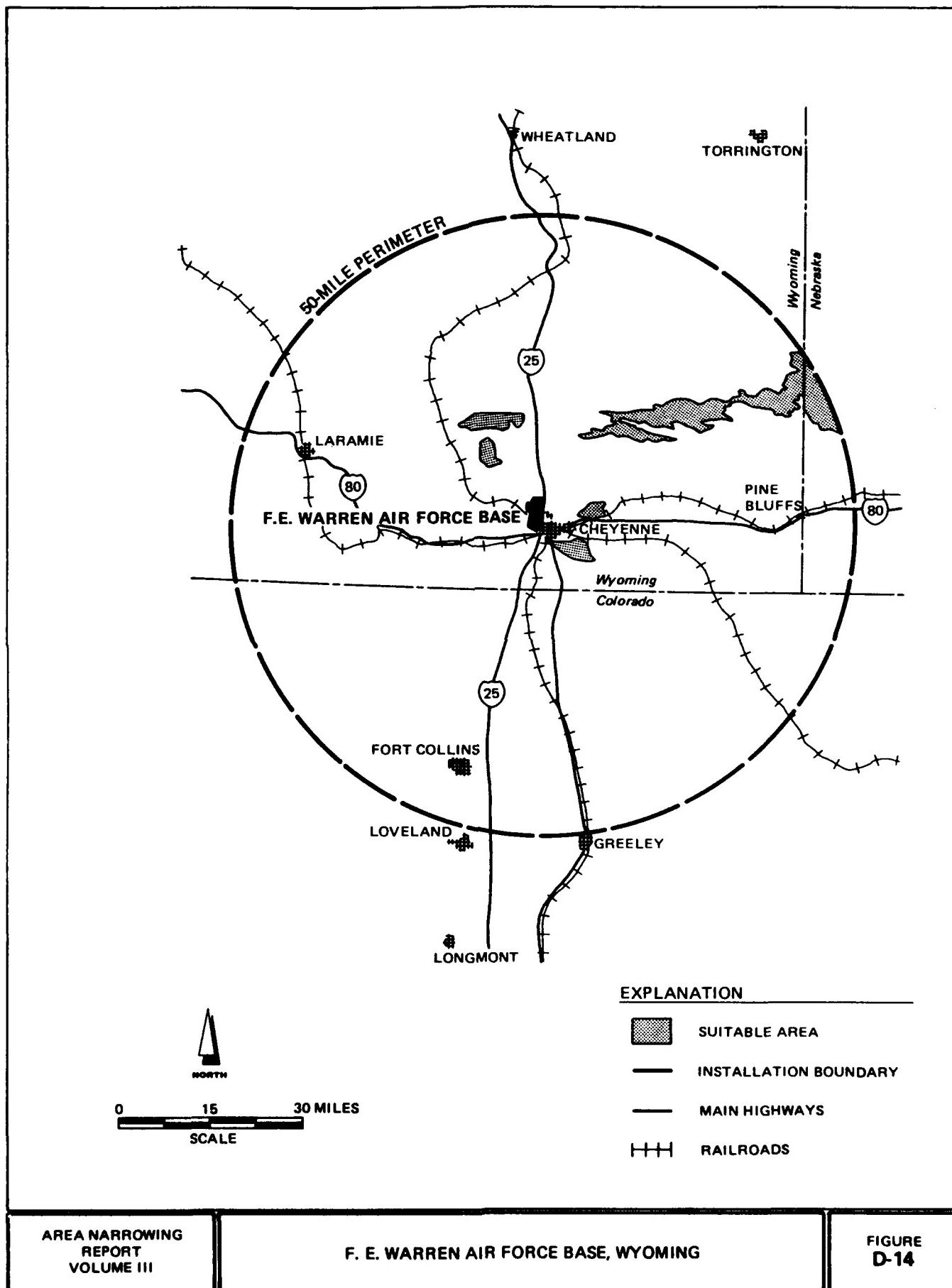
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D-14 Wyoming - Complex

Following application of the Exclusionary Criteria, F.E. Warren Air Force Base was identified as a complex based on its solitary geographic location in southeastern Wyoming (Figure D-14).

F. E. Warren AFB and its potential Deployment Area remain after application of the Evaluative Criteria to the 14 complexes.

The following section elaborates on the performance of the potential Main Operating Base and its potential Deployment Area with regard to the Evaluative Criteria.

D-14.1 F.E. Warren Air Force Base, Wyoming

After evaluating the alternatives among the complexes in relation to each other, F.E. Warren Air Force Base (AFB) remains for further, more detailed study. The potential Main Operating Base/ Deployment Area has favorable characteristics for Hard Silo deployment. On-base land is available for construction of new facilities to support the Hard Silo mission, the base is served by a good transportation system, and there is a nearby community with a wide range of goods and services. In addition, the base is an Air Force installation with existing ICBM missions.

F.E. Warren AFB is located in southeastern Wyoming, adjacent to and west of Cheyenne, the state capitol (Figure D-14). The Denver metropolitan area is approximately 90 miles to the south. The base, presently operated by the Air Force Strategic Air Command, supports the Minuteman and Peacekeeper ICBM missions.

System Effectiveness: The size and distribution of suitable area parcels within 50 radial miles of F.E. Warren AFB would provide some options for siting the Hard Silo system. The potential Deployment Area consists of five suitable area parcels, which total 200 square miles. The parcels range in size from 10 to 142

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square miles.

Security concerns within the potential Deployment Area would be minimal due to the overall density of inhabited structures. Two parcels located near Cheyenne contain large areas of low density inhabited structures and pose greater siting and security concerns than the other parcels. Throughout the potential Deployment Area, the distribution of transportation and utility corridors cause additional security concerns.

System Operability: The efficiency of Main Operating Base activities is enhanced because the base is adjacent to the support community of Cheyenne. The accessibility of the potential Deployment Area to maintenance facilities at the Main Operating Base is dependent upon the final parcel selected for siting and its distance from the Main Operating Base.

Distances to parcels from F.E. Warren AFB range from 11 to 57 road miles and average 29 road miles. These distances could enhance maintenance operations.

F.E. Warren AFB contains suitable land for new facilities to support the Hard Silo mission, including Weapons Storage Area/Stage Storage Area facilities.

F.E. Warren AFB currently supports an ICBM mission and so has personnel experienced in the operations required

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to support the Hard Silo system. New facilities would be compatible with the present ICBM mission. All land on base is DoD fee owned.

The utility infrastructure at F.E. Warren is adequate for present base operations with potential for expansion to meet future demands. Electrical power is presently supplied by the Western Area Power Administration. The system is presently at maximum capacity. Heating is provided by natural gas supplied by the Cheyenne Light, Fuel, and Power Company and the system has excess capacity. Waste-water treatment, provided by the city of Cheyenne, is adequate to meet present and future needs. Solid waste is collected and disposed of by private contractors in the Cheyenne landfill. The existing landfill capacity is adequate to meet future demands. The base storm drainage system is capable of handling the runoff that occurs on-base. The base water supply is presently purchased from the city of Cheyenne and increased water use may not be viewed favorably by the state. It is therefore questionable whether sufficient water is available to support new facilities for the Hard Silo mission. Significant expansion of the existing water supply facilities would be required. Water would not require more than conventional treatment prior to domestic use.

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The F.E. Warren AFB transportation system is somewhat limited by a lack of airfield facilities on base. The municipal airport, which is located 2 miles from the base, has a 9,200-foot, fully instrumented runway and is jointly used by the city of Cheyenne and F.E. Warren AFB. Highway access is provided by Interstate Highways 25 and 80, which are due east and south, respectively, of the base. Rail service is provided by three different lines, with a Colorado Southern Railroad line crossing the base.

Because F.E. Warren is an Air Force installation with existing Strategic Air Command Minuteman and Peacekeeper ICBM missions, the logistic and personnel support systems would be compatible with a Hard Silo mission.

The support services at F.E. Warren are adequate, as indicated by the size of the support community and the housing availability. On-base housing is presently limited; however, expansion is anticipated in order to upgrade the on base housing. Off-base housing availability may be affected by the highly competitive housing market. The city of Cheyenne (population about 47,000) is the nearest community capable of providing a wide range of goods and services for base personnel.

System Practicability: Construction aggregate is available through purchase and/or direct development

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and sources are distributed throughout the region. Adverse terrain is present in a portion of most parcels and affects 4 percent of the Deployment Area. This condition may impose some system siting constraints and can increase construction and security surveillance costs.

It is questionable whether sufficient ground water for system construction and operation is available within the Deployment Area through direct development. Most suitable area parcels are located within state defined and regulated ground-water control areas. Surface and ground water in the potential Deployment Area would require only conventional treatment prior to construction and operation use.

Public Impacts: There is some potential for land-use conflicts from deployment of the Hard Silo system within the Deployment Area. Agricultural land occurs in portions of most parcels and affects 46 percent of the potential Deployment Area; 21 percent of the Deployment Area is classified as prime and unique farmland. Potential timberland occurs in less than 1 percent of the Deployment Area. Future land-use development plans and trends will adversely affect some of the Deployment Area. Presently, 100 percent of the townships in the Deployment Area have 20 percent or

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greater area under energy or mineral claim/lease.

Known energy resources occur in 5 percent of these townships. High value mineral resource areas do not occur within the townships.

There is no on-installation suitable area within 50 miles of F.E. Warren AFB which precludes the potential for Hard Silo deployment on DoD/DoE installations. The majority of the potential Deployment Area is privately owned land.

Transportation and utility corridors affect approximately 55 percent of the potential Deployment Area and decrease the siting options available to the Hard Silo system. A substantial effect on water availability in the support community of Cheyenne is likely to occur due to the increase in population from project workers and their dependents. Sufficient ground water may not be available from existing sources for use in the support community due to state regulations concerning ground-water withdrawals.

Natural hazards in the potential Deployment Area are considered minimal. Portions of most parcels are located within identified 100-year floodplains, but affect only 2 percent of the Deployment Area. Public safety concerns will be minimal due to the very small concentrated areas of low and high density of inhabited

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structures within the Deployment Area.

Although the city of Cheyenne can provide a wide range of goods and services, the region and outlying areas have a relatively low urban population, implying limited goods and services for support of system construction and operation. Nonagricultural employment in the region is also low, which increases the likelihood of inmigration of project-related workers. Regional employment in the construction and military sectors is relatively low as well, which suggests that new workers generally will have backgrounds dissimilar to those of the resident population. The economic diversity of the region is good, as indicated by the number of export-producing industries. Local governments in the region may not be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the region is very limited. Some of the comparative regional disadvantages will be offset to some extent by the proximity of Cheyenne and its apparent ability to provide a wide range of goods and services.

Environmental Impacts: The potential Deployment Area is in attainment for all major air pollutants and activities within the suitable area parcels would not likely affect any Prevention of Significant

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Deterioration Class I areas. Cultural resource sites listed in the National Register of Historic Places are located within the Deployment Area. Additional cultural resource sites may be discovered if a detailed field survey were performed in the Deployment Area. The potential Deployment Area contains no Wilderness Study Areas, RARE II areas, experimental ranges/farms, or National/State forest land.

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